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OF

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EDITORIAL.

THE TUBERCULOSIS PROBLEM.

THE tuberculosis problem is essentially a medico-sociological one. It is not merely a puzzle in pathology, but appeals to all sorts and conditions of men as a question of world-wide importance, touching the deepest interests of humanity. To deal adequately with the intricate entanglements of this universal scourge requires keen mental insight and patient toil. The evil cannot be satisfactorily studied as a definite and well-defined ill, but must be tracked and traced in all the perplexing mazes of its complex causation, and laid bare in each of its manifold associations. Pathology, in its wide revelation of disease in animals and men, has unveiled much of the mystery of tuberculosis. Medicine through the ages has been slowly and laboriously accumulating facts and perfecting clinical methods whereby it might interpret the many and varied manifestations of the disease. Sociology now claims a right to tender evidence and deduce conclusions, and insists that such a malady as tuberculosis must be studied with due regard to human action in relation to natural, social, and economic conditions of life. The magnitude of the problem can scarcely be overrated. In almost all countries and among nearly every people the disease hinders and hampers national progress, and works incalculable domestic misery and individual suffering. Not only is State action imperative for the protection of each country, but international co-operation is essential if such comprehensive and scientifically directed policy is to be adopted as shall make for the extermination of this bane of humanity.

THE PATHOLOGY OF TUBERCULOSIS.

Koch's epoch-marking discovery of the tubercle bacillus divides the history of tuberculosis into two clearly defined periods. The importance of a recognition of the exciting cause cannot be overestimated; but it is becoming more than ever apparent that our precise knowledge is but in its beginnings, and necessarily lacks in directing force. We still linger in doubt as to the various forms of the tubercle bacillus, the conditions producing difference in virulence, and the transmissibility between man and animals. Even as regards the means of dissemination and the channels of infection there is no little conflicting testimony. And if we have but limited information regarding the seed, even less is definitely known regarding the nature and characteristics of the soil which harbours the parasite of tuberculosis. The very word "predisposition" is indefinable; and even proclivities formerly believed to be dependent on the mysterious moulding power we call "heredity" are now often denied or disputed.

But in the ferment of thought and the turbulence of ill-defined action much of far-reaching value is coming to the surface. The claims of the rapidly multiplying anti-tuberculous sera are being investigated, and some grains of wheat are being winnowed from the chaff.

Recent researches into the nature and significance of opsonins and their bearing on remedial measures have opened a new kingdom to the serious student.

Much valuable pathological evidence has lately been presented relative to the occurrence of latent tuberculosis in early life, and seems to fully justify the special attention which France is devoting to secure the prevention of tuberculosis among children both at home and at school.

In every department of anti-tuberculosis effort there is urgent need for a more complete and precise pathological basis for action.

MEDICO-SOCIOLOGICAL CONSIDERATIONS.

Tuberculosis is a malady which not only demands the study of the pathologist and the sanitarian, and the care of the physician and surgeon, but calls for the serious attention of every worker in life's strenuous workshop. For in this campaign everyone should volunteer—the citizen and the statesman, the labourer and the capitalist, the teacher and the scholar, the social reformer of every school and the patriot, whatever his rank or creed. Medical direction and control must be associated with sociological inquiry and humanitarian enterprise.

The tuberculosis problem can only be satisfactorily solved by first dissipating those tubercle-producing conditions of life and work which

are dependent upon ignorance, apathy, selfishness, and neglect. The arrest and extermination of tuberculosis, if it is ever to be attained, must be by a reform of the human factor and a reconstitution of his environment.

This being so, it is clear that the question must be viewed from a broad standpoint. It is to be investigated not as a small field in the wide domain of pathology, but as an integral part of that greatest of all subjects of inquiry—the revelation and restoration of mankind.

SANATORIA FOR THE CONSUMPTIVE.

Among modern methods for coping with tuberculosis, particularly in the form of pulmonary consumption, hygienic management has very rightly won a foremost place. This application of the laws of health to the treatment of disease, although long advocated by far-seeing pioneers, has only recently received that recognition necessary to elevate it to the dignity of an adopted principle of medical practice. Experience has abundantly demonstrated the importance of the sanatorium as a desirable, and even essential, institutional centre for the conduct of effective hygieno-dietetic measures, and as an educational school for rational living. Fads and fancies have gathered about so-called "open-air" treatment, and impossible claims have been made by inexperienced enthusiasts as to the almost miraculous efficacy accruing from sanatorium residence. In spite of all exaggerations and failures, there can be no doubt but that the maintenance of a strictly hygienic course of life offers the best means known to modern medical science for dealing effectually with tuberculosis. The difficulty in bringing early cases to seek medical advice, the often unavoidable delay in admitting patients, the financial and other obstacles to continuing treatment for a sufficient period, the impossibility, in the majority of cases, of permanently reforming the habits of life and securing healthy conditions for the conduct of suitable work, the failure to maintain medical "after-care"—these and the like make it astonishing that sanatorium results are as good as they are.

It is more than unfortunate that in England at least the absence of any co-ordination or co-operation among our public sanatoria is productive of incalculable loss of time, waste of labour and misuse of money, much hardship to patients, discouragement to staff, and the discountenance of rational methods of treatment. The present means for procuring admission to our publicly supported sanatoria is, in only too many instances, exceedingly unsatisfactory for patients and for all concerned, and is proving highly detrimental to the best interests of scientific medicine. By the commonly prevailing haphazard procedures now only too generally countenanced, a class of "consumptive vagabonds" is

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being produced, and serious injury is being done to the community and little or no permanent benefit results to the tuberculous individual. The whole subject of sanatorium management needs to be thoroughly investigated in the light of the now very considerable accumulated evidence available. It is much to be desired that an authoritative inquiry should be undertaken, preferably by those responsible for the conduct of our public health service, and all sanatoria should undoubtedly be submitted to official inspection by recognised experts.

The sanatorium is one of our most important agencies for dealing with the consumptive, but it is very necessary to remember that it forms only a part of the many means and measures which must be adopted and effectively maintained if success is to be the issue of the anti-tuberculosis campaign.

SPECIAL ARTICLES.

THE STUDY OF TUBERCULOSIS.

A Retrospect.

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WHEN the Editor asks me for my retrospect of tuberculosis, he bids me look back upon events whose marvel can scarcely be seen truly unless the eye be shaded from the many other wonders of the last half-century—from the victory over typhoid fever, diphtheria, and septicæmia; from the rout of typhus; from the exposure of the fatal secret of malaria. Before my eyes are closed we may have tracked out the malignancy of cancer, and clapped a bridle on the earthquake.

Early Recollections.

My retrospect begins in a shaded parlour at Ventnor, a room in which we were taught the art of embalming the air by stuffing cotton about the doors and pasting paper about the window-frames. There I had been sent as a little boy for whom it would be very nice to have such a change from the sterner and gloomier climate of a fifteenth-century house in the north—a house built in a churchyard, and priding itself over the countryside in the sparkling water of its well in the scullery—or should I have written "skullery"? So for a time I was to be the child companion of my father's cousin—a pretty lady, sweet and fragile, who had gone to Ventnor for a consumption. Little child as I was, even then her long thin hands, her wan face, her frail, willowy figure and gait made me wonder, almost more than I wondered to see the chicken, and the jellies, and such cates dismissed almost untasted. Even still I seem to hear the hack-hack of her hollow cough—too hard and hollow to come from that slender body; and again, the quick, stealthy coming and going of the physician; and the mysterious hours in the bedroom—once very long—when I heard whispers of a blood-spitting. Then, when the sun shone—it was winter, and the sun no constant visitor—my delicate lady ventured to pace—how slowly she paced!—up and down the south of the terrace. Such a poor short walk it seemed, after so much waiting and preparation, so much cloaking and muffling, and the eclipse of the hot

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cheek under the close black respirator, over which the fine Highland woollen veiling was folded again and again. The respirator I used to watch for eagerly when the walk was over, that, unnoticed, I might unbind it and separate the shining silver webs of its mysterious structure—a pretty plaything for a pink-faced, fair-haired child. Or sometimes, on finest days, there were greater excursions—the bath-chair or the still wilder career of a donkey-carriage.

One day a medical uncle (I had five of them), whom I overheard speaking reverentially of one Laennec—I learnt to spell the name afterwards—left on the table even a greater novelty than the respirator—a little column turned out of fine wood, with ivory parts cleverly screwing on and off, and within a little smooth cone, which fell out when one end was opened. This engine, as I supposed, had belonged to Mr. Laennec.

However, at length I went home again, and gladly. The experience was indeed new, and the lady sweet; but it was all weird, still and stuffy, and rather sinister. Happily, I was none the worse; of her or of the respirator I did not get even a scrofula. I was told afterwards that she went with her husband very far away—to Madeira—which I supposed, for her good, to be even stiller and stuffier. But she had died, they said, and we wore black clothes for a few weeks.

However, the bacteria did not leave me unscathed. I did get "continued fever" from the sparkling well at home. One of the medical uncles treated me by venesection, antimony, and mercury. I bear still on my back the deep scars of some blisters by which, with the metals and the lancet, my life was saved. We were all touchingly grateful to him ever afterwards, and rightly so. He did his best for me—watched many an hour at my bed, and was very happy when, after some ten days in another world, I returned to consciousness.

Thus was my little life spared to pry into the affairs of the medical uncles, where I saw more and more of these hothouse plants like my cousin, and wondered whether the gardeners were stupid, or the houses not hot enough—for all of them died! Indeed, no one ever seemed to suppose they would get well! Even the great lady whose case was a nine days' wonder in our circle—the lady for whom, as she would not leave her children for Madeira, her devoted husband declared Madeira should come to her, and built her a garden of glass, and shut her up in it—even she died too, just like ordinary people. Consumption was, in all their families, inexorable. *Tu ne quasieris, Leuconoe, scire nefas*, or at any rate, *vanitas*.

Student Days.

Then as a student I began to prowl in the hospitals, where I saw these consumptives in flocks. "Only phthisis," was the monotonous diagnosis. They used to sit on a side-bench with infantile palsies and

the rest, not as infectors, but as incurables. Meanwhile they were comforted with large beer-bottlefuls of balsams and liniments—a sort of liturgy, as it seemed to us; for every week one or two came no more, and others took their places.

The Practice of Pioneers.

Thus it was till I entered on my own practice, when I made the acquaintance of Archibald Smith and of Bennett and Bennet, who talked extravagantly of curing consumption, and even bragged of having done it. And with their enthusiasm we young fellows were bitten. We, too, began to persuade our phthisical out-patients to swallow Bennett's oils, then so dirty, malodorous, and nauseous; though, for aught we knew, in their impurities their virtues lay hidden. Bennett's oils, and his more sensible treatment of his patients, brought two changes about: our "cases" did better—some of them—and hope, or a pale dawn of it, appeared afar off.

But it was Bennet—Henry Bennet, crowded out of the "Dictionary of National Biography" by many less meritorious namesakes—who startled murky London by sleeping with his window open—open in the vaporous and chilly night when all infections walked abroad! Yet Bennet ought to know best, for was he not himself a *poitrinaire*, and one, moreover, who didn't die? At his new resort of Mentone it was that he cured himself—not by open windows, indeed, for he had none, not even a house. He had there but a garden to live in—a garden with one of Sir George Beaumont's ruinous brown towers in it, for his spade and his coffee-pot. Yet such a life, possible, perhaps, in such a garden, seemed possible there only. Nevertheless, the wealthier consumptives heard of a new liberty; a ray of sunshine broke into their stuffy chambers. They, too, might go to Mentone, cautiously open the window a little at the top, and draw one foot back a while from the churchyard. Next, it was Andrew Clark who surprised the town by getting well and flourishing amain. The poor, meanwhile, went on drawing their hope only from the necks of the oil-bottles and from their own courageous hearts.

The Discovery of the Alps for the Consumptive.

One spring, when I was with Bennet at Mentone, rumours reached us of a certain Mr. S——, an English consumptive, who, as he happened to live in Switzerland, had braved the arctic winter of the high Alps at St. Moritz—a remote hamlet in the wild uplands of the Inn, known only in summer to a few frequenters of its spa—and declared it had cured him. Well, Bennet's Mentone plan was well enough, but it was not infallible; there was a hole in that Dutch oven. Could there be

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anything better still? As a member of the Alpine Club, I had heard legends at our camp-fires from Hans Grass—there were no “huts” then for the climber—of the ineffable splendours of the Alpine winter, and of the glorious bacchanalia of the wine caravans which wound their way over the Bernina, spilling the sunny red wine upon the stainless snows. And my climbing brother, T. S. Kennedy, also brought back such a story from a winter attempt on the virginity of the Matterhorn. For some years Dr. Archibald Smith had been talking to us of the cure of phthisis by the air of the mountain plains of Central America and Quito—regions far enough away to be fairy lands, with all their inconsequences. But a bigger and nearer story now reached us of two consumptives—Dr. Unger and Mr. Richter—how they had betaken themselves to a secluded vale in the Grisons, and, having got well there, made it their home. So in 1877 I went to Davos to visit these gentlemen, and at our first interview Dr. Unger told me of victories, present and to come, which amazed me, concluding thus: “Herr, hier in Davos sollen wir über die ganze Riviera vollig triumphiren”—words at that day amazing enough. And he and Ruedi took me to visit their “cures” by the score—absolutely *cures*, as it seemed; and by what a daring and adventurous life! At the first *table d’hôte*, amid the company of jolly sunburnt skaters and tobogannners, I asked: “But where are the patients?” If one was beginning to forget the sad-eyed, fading recluses of the Georgian parlours, one had hardly escaped from the impressions of the fragile roses of the Riviera. Who, then, were these brown, untransparent men and women, vociferating about sports, and emptying the dishes almost before they reached the table?

At this time in Davos there were very few English, but Mr. Waters was there, engaged on his valuable meteorological records, and Mrs. MacMorland, who wrote a little book on Davos, and kindly gave me much help. Of Germans, however, there were three or four hundred; so that there was material in plenty for observation. The results of these observations I published—I am asked for my “reminiscences”—in the *Lancet* for October 20 and 27, 1877; in the next winter 50 English went there, and in the following winter more than 250. In 1878 I published (also in the *Lancet*) another report on Davos, with notes on 100 cases. In 1879, at the meeting of the British Medical Association at Cork, Bennet and I—by no means in accordance—brought the subject before the Section of Medicine, Bennet striving for the pre-eminence of Mentone, while I was for Davos. Dr. James Little supported me; Dr. Borchardt of Manchester also spoke up for the high Alps. The only other speaker was Dr. Jagielski, who narrated the cures of the steppes of Asia. Andrew Clark, who was in the chair, spoke with much hesita-

tion, being, on the whole, naturally sceptical about the alleged successes of Davos.

On my first visit to Davos, I arrived with Mr. Addington Symonds, now almost the solar myth of the valley. On Jenner's orders, he was on his way to Egypt, but, as the Alpine cures had reached his ears, he had deviated to Switzerland to visit Davos. After hearing what I had to report about the apparent therapeutical results, he placed himself in my hands for further advice. In Jenner's absence, to interfere with his orders was a delicate and responsible matter; the more so as I found Symonds in a perilous state. Both lungs were deeply affected, and with signs of active softening and excavation.¹ Finally we decided that he should remain in the Grisons for a few weeks, and if all were well, venture on the winter. As the experience was not unfavourable, Jenner somewhat reluctantly gave his consent to a residence which, happily, had the duration and the results so well known in the worlds of medicine and of letters.

Even in the Grisons, however, it was not all success; far from it. Medical treatment erred both in commission and omission. Harm was done at first by excessive and indiscriminate hydropathy—especially by the douche, and by profusion of alcohol. A bottle of red wine a day was a common prescription, often doubled by the too obsequious patient; so that the new capacity for generous feeding, counselled by the physician and promoted by the keen air, was in some measure thwarted by it. That very unfit cases were accepted, or permitted to remain, was not altogether the fault of the Davos physicians. A certain period of experiment was, perhaps, inevitable; and physicians at home, although warned again and again not to send elderly, broken-down, or febrile invalids to the high Alps, yet did so continually, and not blamelessly. And it seemed hard, in the flush of their new hopes, to dismiss them too summarily. The faults of omission were still worse. The part of bodily quiescence in the cure was ill understood; that of unquestioning submission to exacting medical governance was scarcely apprehended. Patients danced and gambled at cards and billiards till the small hours of the morning in ill-ventilated, tobacco-tainted apartments; the place was to be all in all. For young, active patients with incipient disease its effects appeared, indeed, so remarkable that the general heedlessness was resulting in sheer anarchy. Visitors would pay a fee or two on arrival and another on departure just for "reports on their chests," jaunting meanwhile as they pleased. Precautions against infection, even after 1882—for some years, at any rate—were either neglected or perfunctory. The marvel was that with such revels the results were what, indeed, on the whole, they were.

¹ I trust that at this distance of time, and in the case of one whose memory is a public honour, these intimate particulars will not seem unbecoming.

The Evolution of Hygienic Treatment.

Happily at this crisis the method of Brehmer, and a little later of Trudeau and Walther, were rumoured abroad. Davos had to comprehend that climate was not everything; that lower lands with method would rival high lands without it. The management of rest and exercise was tentatively worked out, and—especially by Walther—the need of unconditional submission to a medical vigilance which controlled every act of the patient and almost his every thought. On these principles Dr. Turban commenced his sanatorium at Davos.

But there were more practical problems still to be solved; the fragile, whimsical, pink-and-white patients had disappeared, too often, however, to give place to the bloated habit not invisible even to-day. Futile coaxings of capricious stomachs were succeeded by indiscriminate stuffings. Again, diagnosis had to be reconsidered, and the truth ascertained that the first appearance of physical signs indicates not "incipient," but well advanced disease. Furthermore, the not unnatural exultation in the new sanatorium methods led to exaggerated expectations, only not absurd because so infinitely pathetic. From the "faint cold fear" of phthisis, palsyng effort, men were rushing to the notion that the disease was little more than a bogie, to be exorcised by a three months' ritual in these sanctuaries—and let us hope this phase too may now be included in my "retrospect." May I not assume that we have learned that wisdom lies in moderation; that climate has no specific virtues, but that the colder and fresher the air the individual can tolerate, the better will be his appetite and his digestion; that to stuff the stomach without regard to its frequent atony, especially in pyrexia, is only less unwise than to be content with cockering a fanciful one; that to bloat a patient is better than to let him emaciate, but is not the last word of wisdom; finally, and above all, that to fight phthisis is to set our wits against a foe as malignant and stealthy as it is deceitful and obstinate? It is not for the physician to add to its deceits; let the physician tell the patient frankly that he is fortunate in himself and in his circumstances if, having reached the stage of physical signs, he is soundly healed in less than two years and a half or three years from the time of their first manifestation.

Of the advances of pathology in the interpretation of tuberculosis, and especially of Koch's cardinal discovery in 1882, I have left myself no room to speak; perhaps already I have said more than enough. How the problems of its pathology are betraying their complexity on the one hand, but on the other are coming to better and better definition, so as to arm us with greater and more definite powers, will appear in the subsequent pages of the Journal.

An Anticipation.

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To try to paint the possible conquests which lie before the workers in the field of tuberculosis were a fascinating task. With a free hand and no stint of colour, an attractive picture might readily be sketched. It is less easy to forecast accurately the lines on which advance should and will be made. The outlook of the future changes from day to day with each new discovery. An "anticipation" such as the Editor desires, while breathing the spirit of prophecy, must rest chiefly on a just appreciation of the present position. The prospect of the future is largely the reflection of the present. To conjure up what will be is to realize the natural trend of research and effort.

The Full Significance of Koch's Discovery.

Those of us who were reared in the older faith were startled by the swift intimation by Koch that tuberculosis was certainly due to inoculation by the tubercle bacillus. Before that announcement, Klencke, Villemin, Cohnheim, Klebs, and others, had indicated that tuberculosis was an infective disease; but in practice the conception of consumption as an infectious malady played an insignificant rôle. Whenever whispers of such a view became audible, they were promptly hushed by magisterial citation of evidence to show that infection never occurred. The evidence was obtained from consumption hospitals, where consumptive patients were suitably handled.

When the tubercle bacillus was accepted as the cause of tuberculosis, there remained no room for valid objection to the infectious view. The tubercle bacillus afforded a criterion as to what should be considered tuberculous. In doubtful cases the determination of the bacillus rendered diagnosis certain. It became evident that study of the life-history of the bacillus might yield important information as to the pathology of the disease, and render possible a scientific therapeutics. Knowledge as to the distribution of the bacillus and its avenues of entrance into the human subject might lead far towards a rational prophylaxis.

It was in the autumn of 1882 that my interest was definitely awakened in the subject. I was engaged in a research on the development of the trachea in the Embryological Laboratory of the University of Vienna under Professor Schenk, of "sex" fame—an original thinker and no less distinguished histologist. One morning—I recall it vividly—the Professor called me to see his preparations of tubercle

bacillus. He was entranced with delight, and there and then indicated his belief that the discovery must lead to an entire *volte face* in our conceptions of the disease. For weeks thereafter much of our business was to stain films from discharges obtained from the wards of the general hospital.

For years, however, little heed was paid practically to the tubercle bacillus. The older generation of doctors looked askance on the new doctrine. I remember well—when I returned to Edinburgh in 1883, keen with hopefulness which the discovery inspired—the disappointment which met me at the threshold in the remark of one of the kindest of my former teachers. When I told him that I proposed devoting much of my time to the subject of tuberculosis, his rejoinder was: "Don't think of such a thing. Phthisis is worn to a very thin thread. The subject is exhausted."

As time went on, the full significance of the discovery grew more and more apparent. The beauty and exactness of the original work impressed men. Careful, critical observations confirmed it. Based thereon followed patient researches in an endless variety of directions as to the character—morphological and biological—of the tubercle bacillus, its life-history, the effects of this on the tissues of its host, and the histology of the induced processes. Better instruments and more delicate histological methods carried investigation forward by leaps and bounds. There resulted truer conceptions on etiology; the toxic influence of the tubercle bacillus on the human organism began to be realized; the meaning of constitutional symptoms following invasion became apparent, and death, formerly attributed loosely to advancing weakness, was traced to the elaboration and absorption of poisonous products. In consequence, larger views took shape as to the possibilities of antagonistic procedure with a view to cure, and of prophylactic measures with a view to eradication of the disease.

The vague generalities of an older faith gradually gave place to a unity of conception, which recognised in the tubercle bacillus the essential cause of all manifestations of tuberculosis, whether in lungs, bones, joints, glands, or skin, or in so-called scrofulous processes. Hereditary taint came to mean greater liability of tissue, and it was recognised that no individual, no age, no race, was exempt from infection.

Statistics quickly accumulated, showing the overwhelming extent of the ravages of the bacillus—the annual hecatombs, vaster than the vast offerings sacrificed yearly to the other acute infections, and the great crowds of men and women physically and financially ruined.

Now, happily, the tremendous significance of the tuberculosis problem begins to be realized. There are signs on every hand that the peoples of the world are looking into the question. As Professor

Charles Richet, of Paris, said to me in chatting over the matter: "This is a big social question, and not merely a doctor's affair." While not oblivious as to the needs and uses of direct therapeutics, the wider outlook of medicine must be towards prophylaxis and final eradication. Exterminate the tubercle bacillus, and tuberculosis will survive only as an historical monument.

Direct Attack on the Tubercle Bacillus.

In keeping the larger ideal constantly in sight, we do not belittle the interests of the individual patient. On the contrary, anything which tends towards recovery, even of one individual, makes towards the final extinction of the disease. In this sense, all direct attacks on the bacillus are of first interest.

Unhappily, such attempts by introduction into the tuberculous focus of antagonistic agents from without have been to little purpose. The list of drugs is immense, but the net result is not encouraging. We have found no drug which can be introduced into the circulation in sufficient quantity to prejudice effectively the development of the bacillus which does not exert at the same time toxic properties on the cells of the human body, thus tending to hasten the issue which it was hoped to avert. Whether such agent may yet be discovered, it is impossible to say. In view of the significance of iodide of potassium and mercury in syphilis and of quinine in malaria, the possibility of such discovery may fairly be kept in view.

The Tubercle Bacillus shows the Way.

Of supreme interest is the attempt to antagonize the bacillus by products obtained directly or indirectly from itself. Autopsies have revealed that tuberculous disease may be cured, as we commonly say, spontaneously. The query as to what determines spontaneous cure is one of paramount importance. Its discussion would carry us far beyond the limits of this short study. Suffice it to recall, that there is reason for the belief that the healing process is initiated by products produced *in situ* by the bacillus.

From this we may trace the dawn of tuberculin. To Koch belongs the credit of directing men's gaze in this direction. His announcement that it was possible to extract from cultures of the bacillus an agent possessed of specific properties, so far as tuberculosis was concerned, was simple and definite. Unfortunately, the announcement was heralded with too much sound of trumpet and drum, and a delicate scientific procedure was hastily tackled by an impatient crowd, both lay and medical. Accidents happened, and voices from high places began to whisper danger. The tones of alarm grew louder and louder, and the pendulum swung violently from over-sanguine expectancy to

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hesitating doubt and mistrust. Thus was a method, resting on sure observations, allowed to fall largely into abeyance.

The Promise of Tuberculin.

None the less, Koch's conception of tuberculin as a healing agent has survived. At the present moment it remains a living force. I find myself in a small minority who have maintained the use of tuberculin during fifteen years since its first announcement. Throughout that period it has been employed continuously in one or other form. I am glad to have the opportunity to record in the first number of the BRITISH JOURNAL OF TUBERCULOSIS my conviction of its great significance as a curative agent. I have treated a large number of cases of tuberculosis of different organs, in most instances with satisfactory results. I have seen tuberculous larynxes pass from a state of active ulceration to complete cicatrization. I have seen agonizing dysphagia, from tuberculous involvement of the epiglottis, yield to one or two injections, so that the patient could swallow comfortably. I have seen genito-urinary tuberculosis improve remarkably. I have seen a rectal discharge of pus, to the extent of 8 to 10 ounces *per diem*, which had gone on continuously for over three years in spite of several surgical operations, yield speedily and completely to tuberculin treatment. I have a large series of cases of pulmonary tuberculosis in which, undoubtedly, the progress towards recovery was hastened by the measure. I might also cite several instances of extreme breathlessness, asthmatic in character, suggestive of pressure from without—*e.g.*, by enlarged glands—where the distressing manifestation was quickly removed by means of tuberculin. Such examples might be multiplied, did the limits of this study permit.

While far from advising hasty or blind allegiance to the method, prolonged experience makes me conclude that in tuberculin we have not only an interesting scientific principle, but also an agent of great practical significance. There is reason to anticipate still greater things as the method becomes more fully developed.

Two thoughts occur to me in this connection: Firstly, with regard to tuberculin itself, we may look for further developments in its elaboration. Certain of the toxic manifestations which have been reported are doubtless due, not to overdosage merely, but to the presence of associated toxic principles, dependent on the nature of the culture medium rather than on the tubercle bacillus directly. From this point of view, the work of Béraneck is of great interest. With remarkable devotion he has set himself for several years to the elaboration of a less toxic tuberculin. His investigations have proved most fruitful in respect of the possibility of cultivating the bacillus on a peptone-free medium. The tuberculin thus produced has well-marked

specific properties, while its toxic action is slight. From its extended employment during several years, I am satisfied that in Béranek's tuberculin we have an agent of much therapeutic activity, whose toxicity and associated disadvantages are small.

The latest announcement in this direction is that of tulse, by Von Behring. Tulse is a clear liquid, containing in solution substances derived from the bodies of the bacilli. It may be introduced subcutaneously, intravenously, or by the stomach. By its use Von Behring claims to have established active immunization against tuberculosis. The mode of action is thus similar to that of the tuberculins. It were premature to pass a judgment on the value of what has been little more than announced. The pity is that so long an interval has been allowed to elapse between the prologue and the raising of the curtain.

The second thought which occurs is suggested by the work of Wright and others with reference to the opsonic index. The possession of an exact gauge for the regulation of tuberculin dosage is certainly desirable. This would seem to be promised in the determination of the opsonic index of the blood from day to day. The originality and delicacy of the procedure are worthy of admiration. Interesting facts have emerged regarding the variations which occur in the blood at different stages of tuberculous infection. These seem likely to throw light on several points in the pathology and therapeutics of tuberculosis, and we may look for further guidance in diagnosis and prognosis. But after comparison of results obtained where the opsonic index was determined and those obtained apart from such determination, I feel doubtful if the method can be credited with all the significance which has been ascribed to it. Prolonged experience with and without the method justifies the statement that, apart from estimation of the index, other clinical evidence is usually sufficient for the regulation both of amount and frequency of dosage.

Serum-therapy.

Turning to serum-therapy, what as to its significance in the treatment of tuberculosis? Various investigators have pursued this line of research, and have advanced claims to credit for their particular method. It must be confessed, however, that the results are disappointing. Neither practically nor theoretically does serum-therapy afford much promise. The therapeutic value of serum treatment is temporary. Its services are conspicuous in acute infections, such as diphtheria, where rapid neutralization of a powerful toxin is required. The immunity produced is essentially a passive one. In the case of tuberculosis, the only value which seems possibly predicable of serum-therapy is in relation to acuter exacerbations of fever. For such

temporary emergencies, where tuberculin is of doubtful efficacy, a serviceable serum may yet be discovered.

To sum up, the hope of successful specific treatment of tuberculosis seems to lie in some adaptation of tuberculin, with a view to production of active immunization, aided, it may be, temporarily, under conditions I have indicated, by a serum possessed of special antagonizing properties.

Cardinal Principles of Treatment.

Of accepted cardinal principles of treatment little requires to be said here. The significance of sunlight and open air is nowadays recognised by all. The marvel is that it took the world so long to admit what now seems a first principle. There is growing acceptance of the doctrine of the *universal* applicability of open-air treatment. It is realized that, as consumption occurs in all countries where it has obtained a footing, it can be treated in all climates with approximately equal success if the larger indications are fulfilled, and that, although change of climate may be agreeable and sometimes desirable, such change is not essential for cure. It is of immense importance that our people should rid themselves of the prevalent notion that the cure of consumption can only be effected under conditions which their ordinary residence and station in life will not permit them to enjoy. Hence it is highly desirable that sanatoria for the working classes should be erected reasonably near the town chiefly interested.

There is an improved conception of the dietetics of tuberculosis, and, happily, recovery from the unthinking creed of inordinate cramming, which, while leading to gain of weight, produced soft and weakly convalescents. Careful observations of metabolism have helped to direct thought in proper channels. The great value of zomotherapy—raw-meat feeding—as a means of improving intestinal metabolism and increasing nitrogen retention has been demonstrated. Sanatoria and hospitals with proper laboratories may still advantageously devote time to research in this department.

State and Municipal Responsibility.

The limits of the present study afford less space than I should have craved for the consideration of the wider aspects of the prevention—or rather, let us say, extermination—of tuberculosis. The great reduction in mortality from tuberculosis during the past fifteen years in this country and America is one of the most remarkable facts in the history of medicine. It is freely admitted that the gratifying result has been attained in part by the general advance of sanitary science and the adoption of well-devised measures directed against overcrowding and dirt, which tend to breed tuberculosis as they do other infectious conditions.

But there is abundant reason for the statement that such general measures may be greatly assisted by methods more specially directed against the tubercle bacillus. This is a question for communities—for the State, municipalities, county councils, and other local authorities. The primary need is a sufficient realization of the extent of the evil and its dependence upon preventable causes. The medical profession can do a vast deal to create a healthy public opinion on the subject. By personal influence, and by such organizations as the National Association for the Prevention of Consumption, great advances have already been made. Much more requires to be done.

Communities must more definitely face their responsibility. To erect a hospital or sanatorium with a few beds, as the case may be, is only to tinker the evil. To be effective, there must be instituted a completer anti-tuberculosis organization under the Public Health Department. Tuberculosis is rightly regarded as an infectious disease, but it presents certain features which require special consideration. It is peculiar in respect of its mode of dissemination and the conditions of environment on which this depends, peculiar in the variety of its manifestations, and peculiar in its usually prolonged course. Hence the plan of combating tuberculosis cannot be modelled entirely on those which have been found serviceable in the treatment of other fevers.

Co-ordination of Preventive Measures.

The solution of the problem requires a carefully co-ordinated plan of action. Much advantage would accrue if a uniform plan could be adopted throughout the country, and, indeed, throughout the world. Of the factors which should go to constitute a proper scheme, the following may be noted specially—viz., notification, a tuberculosis dispensary, a hospital for dying cases, a sanatorium for curable cases, and working colonies. My belief in the need for and efficacy of these several factors rests on prolonged experience. The key to complete success is to be found in their harmonious co-ordination.

Notification.

In order to obtain a sufficient conception of the extent of tuberculosis in our large centres, notification appears to me a sound and necessary measure. I am confident that compulsory notification must be appealed to for the ultimate solution of the consumption problem. All the difficulties which have been threatened in relation to it were similarly advanced in relation to notification of other infectious diseases. Such as they are, they are insignificant compared with the vastness and gravity of the evil to be combated. Till recently the practical difficulty has been the attitude of the Local Government Boards. The English

Board continues its attitude of reserve, encouraged, no doubt, by the lack of unanimity among medical authorities. The Scottish Board has recently, in its circular of March 10, 1906, taken a bolder line and declared in favour of notification. It has pronounced pulmonary phthisis to be an infectious disease within the meaning of the Public Health (Scotland) Act, 1897, and indicates that a system of notification is necessary if the Public Health Act is to be applied effectively to pulmonary tuberculosis. As is well known, compulsory notification has been successfully instituted in New York and in Norway. In the former instance, the rapid development of compulsory notification from a tentative system of voluntary notification is most instructive. Everything seems to indicate that before long compulsory notification will be widely spread throughout the world. The countries and States which hesitate meantime do but delay a certain result.

Notification must not, however, be regarded as a panacea for tuberculosis. In pressing its advantages, some would seem to imply that notification is somehow to effect the extermination of the disease. This is to take too limited a view of the situation. On the contrary, we may not conceal from our view the likelihood that notification will at once raise a number of troublesome questions as to the means to be adopted for the suitable disposal of the vast amount of tuberculous material with which every centre will have to deal.

Tuberculosis Dispensaries and Hospitals.

It is at this point that the significance of the tuberculosis dispensary becomes apparent. In any complete organization against tuberculosis the dispensary will come to play an important part. The dispensary will constitute for every town or district the developmental centre and uniting point of other agencies. It should be under the medical officer of health, but form a separate department of public health activity. It seems to me difficult to overestimate the significance of the dispensary as an instrument of preventive medicine.

It is admitted on all hands that it is the advanced or dying cases of consumption which constitute the greatest source of infection to a community. Among the poorer classes this is emphatically the case—where, it may be, one room is shared by half a dozen persons, one or more of whom may be affected with tuberculosis. The segregation of such cases is a most important move in preventive medicine. My anticipation is that soon we shall have such hospitals distributed as generally throughout the country as are hospitals for acute infectious fevers. The pronouncement of the Local Government Board for Scotland is very clear—that the “isolation of such dangerous cases is a primary duty of the local authority.”

The purpose of the sanatorium is different. It is concerned with another group of patients—viz., those who may be reasonably regarded as curable. The aims and principles of sanatorium treatment are sufficiently well known. There is much to be said in favour of the erection of sanatoria in *immediate* relationship to the centres. Such sanatoria ought not to be very elaborate or costly buildings. The results of sanatorium treatment are highly encouraging, notwithstanding statements made to a contrary effect. If treatment be undertaken reasonably early, it is the exception to find a patient who does not make satisfactory progress. The results would be more uniform if there were a complete understanding as to what constitutes an early and suitable case. The immense economic value of working men's sanatoria has been conclusively established by the facts so often cited relative to compulsory insurance against sickness in Germany.

There remains no space to speak of the benefits to be expected from the establishment of working colonies. In the course of the next few years I doubt not these will exist abundantly throughout the country. There seems much reason for the belief that such colonies in close relationship with sanatoria could be made practically self-supporting.

L'Avenir est aux Audacieux.

The time seems ripe for a great forward movement against tuberculosis. What is chiefly required to insure a successful issue is a fuller and juster conception on the part of our people as to the enormous proportions of the evil to be faced, and their intelligent insistence that the authorities will be sufficiently wise and courageous to adopt measures commensurate with the greatness of the need. Given these conditions, we may confidently look for the final extermination of tuberculosis. Here, as in other spheres, the future belongs to the brave.

DISCUSSION.

THE CARE AND CONTROL OF THE CONSUMPTIVE POOR.

In England and Wales.

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THE care and control of the consumptive poor is admittedly a large and complex question, ranging between matters concerning the liberty of the British subject on the one hand and the best means of circumventing the machinations of a microbe on the other.

General Considerations.

How can we best "care for" the consumptive poor? In the first place, we may do much by preventive measures. These are, however, outside the four corners of my thesis. But what a revelation of unfitness to resist infection attaches to the facts that one-sixth of our population die within the first year, another sixth disappear by the age of twenty, and of the adult males who survive that age our recruiting sergeants can tell us what proportion are fit to stand the strain of the first two years of a soldier's life!¹ The causes of this waste and unfitness of life are the chief causes, immediate and remote, of consumption. The recognition of the disease in its earliest stages is the next most important step, provided the appliances for treatment are ready to hand. A daily moderate pyrexia of more than a few weeks' standing, wasting of flesh and power, sweatings at night, a cough or a diarrhoea, or some local pain, are the symptoms that lead to advice being sought. The doctor makes his examination, and may find definite physical signs in the lungs or joints or bones. But frequently, and especially in lung cases, the signs are so slight and ill-defined as to be insufficient for positive diagnosis. With such symptoms and the slightest possible

¹ Lecture on the Prevention of Consumption, Glasgow Congress, Royal Sanitary Institute, 1905. *Journal of the Royal Sanitary Institute*, vol. XXV.

physical signs, however, a strong case for close observation is made out. It is easy in Metropolitan centres to have any expectoration or other discharge examined for the microscopic evidences of tubercular disease; and within easy access of every village in the country there should be bacteriological laboratories for research, so subsidized by the Boards of Health as to permit of gratuitous examination and report of any such material on proper application from the doctor. For these inquiries involve expense and time, and a special expert skill, which no busy practitioner can give in addition to his other duties. There are, however, many cases in which no expectoration or discharge is obtainable, and some in which for the first few weeks of active tuberculosis no bacillary evidence can be found in the discharges, so that the early diagnosis of tuberculosis still rests mainly upon auscultative investigation and an appreciation of the symptoms. Such adjuncts to diagnosis as the ascertainment of the opsonic index or the revelations of the Roentgen rays are at present luxuries for hospital investigators and for those having care of the well-to-do, and even so, although of great contributory value, they have their limitations. Thus, although the opsonic index of resistance to tubercle in a large proportion of early cases of disease will be found to be low, below 0.8, in a considerable minority it will not be so found, and in some it will be above the normal. This estimation, then, is only of auxiliary value in diagnosis, and especially in treatment. Except in most expert hands, both these methods are apt to mislead.

Practical Reform and its Difficulties.

But having discovered early tuberculosis amongst the poor, what can we do in the way of "caring for" them? It must, in truth, be confessed that at the present time we have no adequate means of treating the poor afflicted with consumption. The village doctor or out-patient physician may make an early diagnosis, but not one-hundredth of the cases so recognised can be taken in hand for proper treatment.

This somewhat startling fact must, indeed, "give us pause." It is due to several causes, some of which are already being partially remedied, and might with combined and co-ordinated effort be wholly removed. Other causes, however, lie deeper down at the roots of our civil life, and will require very delicate and patient handling if they can be removed without producing worse evils. I would venture to quote a few paragraphs of a lecture to the Royal Sanitary Congress at Glasgow in 1904, as touching upon some of the removable difficulties:

"As a means of prevention, or diminishing the death-rate from tuberculosis, the effect of sanatoria has as yet been quite insignificant, for the reason that their adoption for the treatment of the poor has not as yet been organized. It is from the poor and crowded populations

that the vast death-rate from consumption arises; it is from them that the great bulk of poison material emanates. Yet measures for the treatment of consumption amongst them are still ludicrously inadequate. Under the influence mainly of tuberculophobia at the present time, general hospitals are shy of taking in tuberculous cases, convalescent institutions are refusing to receive them, special hospitals have such long lists waiting that they do not receive them in time, and injunctions are frequently sought against the occupation of suitable sites for building more sanatoria. Local efforts on a microscopic scale are here and there started by benevolent people, but they must serve as the mere nuclei of example and encouragement for larger efforts undertaken by municipal authorities throughout the kingdom, before they can effect any notable improvement in the prevalence of and death-rate from consumption."

The Co-ordination of Effort.

The keynote of the present situation is that with plenty of goodwill, with much benevolent but scattered individual effort, and with some municipal enterprise, there is lacking any cerebral co-ordination to organize and press to businesslike results all this chaotic endeavour. It is obvious, as hinted in the above quotation, that our great hospitals and convalescent institutions are neither singly nor in combination rising to their full duty in the circumstances. Instead of adapting a proportionate number of beds for the proper treatment of so prevalent and important an illness as tuberculosis (and affording students due opportunities of studying it), they, under shelter of the infection scare and on the plea of want of appliances, practically ignore consumption altogether. It should be remembered that medical wards require adaptation to meet the needs of special cases, and for such development some share of that expenditure may rightly be demanded which is never grudged to meet the more attractive and strenuously urged requirements of surgery.¹ An enormous wealth of appliances are *almost* ready to hand in our existing institutions. There are acres of ward-space available, with but slight alteration, for the treatment of tubercular cases, not only in our hospitals and convalescent homes, but also in our rural and urban infirmaries. Much may be done to render portions of these institutions available for the consumptive poor, without any attempt to attain the ideals typified in "rounded corners" and "bevelled furniture."

¹ It is right to say that to a very limited extent the Middlesex Hospital (perhaps also some others) has made a step in the right direction by reserving four sanatorium beds for male patients at its country branch, and admitting a few cases into the main hospital, to be passed on after diagnosis to these beds. The plan, so far as it goes, is very successful.

Practical Suggestions.

Without much increase of actual expenditure, means might be found in each county union district to supply a proportionate number of beds on cottage lines in connection with the local infirmaries, where the treatment of early cases of consumption could be carried out with full efficiency; whilst a portion of the infirmary wards could be opened out on more airy lines for the reception of more advanced cases. Such measures would have the double advantage of dealing with cases in the earliest stages and of stimulating local medical interest and efficiency by enabling the medical men of each district to treat their own cases on approved lines.

Sanatorium Treatment.

There cannot be a doubt that the sanatorium principle, carried out in one way or another, affords the best means of restoration for the consumptive poor. In France¹ the municipal authorities, in co-operation with private benevolence, have adopted already on a considerable scale the use of marine sanatoria (of which our Margate Sea-Bathing Infirmary was the first example) for the treatment of "closed" tuberculosis in children—*i.e.*, cases of tubercular glands, joint and bone affections, and "the pretubercular stage" of lung disease. Germany has led the way with large sanatoria for the working classes, carried on in association with compulsory sick assurance, supplemented by Government grants. It is unlikely, for long to come, that in this free country the British public will ever suffer any kind of compulsory contribution, even for its own salvation. It is a question, too, whether a more decentralized scheme of scattered village and urban sanatoria may not, as I have already suggested, be preferable on many grounds. Although we may at least take heart and remember that, with all our higgledy-piggledy methods, this country has up to now led the way in the attainment of a lower and a diminishing death-rate from consumption compared with other countries, at the same time we must also remember that this has been achieved by pioneer work in general sanitation, and any stagnation of effort now or failure to adopt wisely devised special and more ordered methods of progress will relegate us to the second or third place in this splendid rivalry of international enterprise for health.

The "After-Care" of the Tuberculous Poor.

But, supposing the care bestowed has been successful in restoring our patient to working health, what then? How is that con-

¹ See an interesting Report by the Delegates of His Majesty's Government (Dr. Theodore Williams and Dr. Bulstrode) on the International Congress on Tuberculosis, held in Paris, 1905. See also author's Lecture to Glasgow Congress, *loc. cit.*

dition to be maintained? A patient who gets well in a sanatorium does so—(1) By virtue of the associated infections which are responsible for most of his active symptoms and much of the tissue destruction in his lungs being arrested by deprivation of fresh material and by the fortified healing powers of Nature—the results of aseptic air, regulated rest, and feeding. (2) Tubercle, thus deprived of its auxiliaries, tends to become fibroid and to cicatrize, and this tendency is increased by healthy conditions of life. (3) There are auxiliary measures of remedial treatment adapted to individual cases. These conditions and results cannot be obtained for poor patients except in some kind of public sanatorium. After he has been through the course of treatment, how is he to maintain the advantages obtained? It is certain that but few persons, the victims of tubercular disease more or less completely arrested by treatment, can return to the conditions under which their illness arose without relapse within a short time. The evil conditions may be in the habits of the patient or in the overcrowded or insanitary home or work-place. These may all be examined into and more or less amended. Admonish and help him to keep up the sanatorium conditions of his life as nearly as possible, and something will be effected for the good of himself and others. But in a great number of cases of confined indoor occupations a new line of life is necessary to give him any chance of maintaining the degree of health he has acquired. It is probably uncommon for the reinfection to arise directly by the reception of fresh tubercle, but the unprotected surfaces of former lesions are invaded by dirt organisms from the atmosphere of his occupation or living rooms; so-called catarrh (an infective malady) arises, resulting in hyperæmia about the original foci, and consequent fresh bacillary activity there. The fresh-air-cured consumptive is probably more susceptible to these influences from the very purity of his preceding conditions, and he must perforce continue to “play the game.”¹

It may be said that this is rather a despairing outlook for the poor and for those who have to minister to them. But something may be done by classifying cases, making the regulated exercises *occupational*

¹ I am aware that my friend Dr. Paterson (*Lancet*, July 28, 1906) advises on the whole that the consumptive should return after treatment to the work to which he has been accustomed and by which he can earn the highest wages, and so secure the best conditions of life. This is true with many occupations, and I fully agree that much airy and unpractical advice is often given to go voyages, to emigrate, to farm, etc. In truth, with rich and poor the most difficult thing in the world to do is to give the best practicable advice adapted to the needs and circumstances of each phthisical convalescent. Dr. Paterson himself and Dr. Bardswell (“The Consumptive Working Man: What can Sanatoria do for Him?” by Noel Bardswell, M.D., 1906) have given useful hints in this direction. But most certainly for a consumptive to return to factory work, indoor office, dusty shops, and any work involving confinement to close quarters, is to render relapse practically certain.

and *educational* for those patients who should adopt new lines of employment afterwards; something may often be effected in diverting those who require it to healthier kinds of work. When, as may be hoped in the next generation, the 18 to 40 per 10,000 death-rate from consumption is reduced by another 50 per cent., the corresponding reduction in the number of the sick will greatly lighten the labour and machinery for the care of them: a share of the immediate expenses in bringing about this reduction might well be distributed through a term of years, to be partially borne by those who will have the enjoyment of the benefits.

The Control of the Consumptive.

I have said as much as space will allow of the "care of" the poor consumptive. What about his control? Can we control him?

Can we insure that he will take advantage of the best possible means of treatment that thought and care and private and national expenditure have rendered accessible to him? How much prejudice there is to overcome, how many and how pathetic are the difficulties raised, and how small the resources to meet them, perhaps only the doctor and those who work practically with him amongst the poor can realize. You may make and enforce regulations as to public cleanliness, you may exercise private notification, and with tact and kindly persuasion get the homes cleansed that are squalid, more from the despairing torpor of poverty than from the vice of uncleanness. To adopt compulsory notification is, I think, doubtfully justifiable, whilst there are no means of fulfilling its logical corollaries. Persons in receipt of parish relief may have their conditions of life more definitely controlled, but otherwise, for the poor as for the rich, coercion is not warranted, and will not succeed. It is difficult to induce, impossible to order, an as yet able man with early consumption to go in for a cure involving the abandonment of his duty as a man to maintain his family. Can you remove a woman similarly afflicted from the cares of her household if she be not willing? Can you take a child by order of the medical officer of health from its parents on account of "premonitory signs" of tubercle, and send it away indefinitely to strange people by the sea? By no authority can these things be done. In a word, you cannot, with due regard for much higher considerations of national life, altogether control the consumptive. You must rest content to persuade him for his own good, and to endeavour to shepherd his doings for the safety of others. It is one of the great problems of the present time to see how the noble, although often short-sighted, reluctance of bread-winners and parents may be met. But, as I have already said, the necessary appliances are not as yet to hand which shall make the question a practical one. It seems to me that the course of true

hygiene with regard to consumption, and the power of medicine to guide and control the subjects of it, have both been retarded by the precipitate and, I think, unwisely exaggerated manner in which the question of infection has been handled. It is difficult logically to maintain that tubercle has the intensely infectious character attributed to it, and at the same time to advise that patients afflicted with it should congregate together in sanatoria and to urge others to join them. The two ideas are incompatible. For it cannot be said with tubercle, as with diseases like small-pox and scarlet fever, that one attack establishes immunity from a second; it, on the contrary, renders those affected more liable to fresh attacks of the same disease. The inconsistency rests, however, with an inaccurate ætiological pathology which attaches to the tubercle bacillus, a degree of virulence which only belongs to it when associated with the products of contributive insanitary conditions, or which is manifested when artificially introduced into the system experimentally; and prolonged experience and careful consideration of the causation of tubercle leads me to the belief that the infection, as in the case of some other specific infections, is practically borne on the wings of dirt, and that in clean, sanitary places and in open-air conditions it may be safely ignored. How else should our doctors and nurses merely share that mortality from phthisis which is normal for the more favoured classes? The life of a physician resident in a sanatorium and daily attending to his patients is as safe as if he were practising in Cavendish Square. This consideration that tubercle (under conditions other than experimental) is practically contagious only under otherwise unwholesome conditions should remove many of the misgivings which render patients and their families very unhappy, and with rich and poor often greatly hamper medical advice.

General Conclusions.

I would conclude these introductory and necessarily very sketchy remarks by again urging the importance of greater co-ordination of effort and a sounder perspective in all that relates to the care and control of the consumptive poor. Practical physicians as well as sanitarians should be equally partakers in the work which, with other matters affecting the health of the community, such as lunacy and alcoholism, health statistics, and the registration of disease, might well be under the supreme supervision of a Ministerial Department of the State. Meanwhile, cardinal economic laws and the traditions of a free people cannot wisely be strained in the impatient and futile endeavour to extirpate consumption entirely in a few years.

In Scotland.

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Prevalence of Phthisis and other Forms of Tuberculous Disease in Scotland.

In Scotland at the present time some 6,000 persons die every year from pulmonary phthisis, and some 4,000 persons from other forms of tuberculous disease. There are no definite data for forming an exact estimate as to the number of tuberculous persons *living* in Scotland at the present time, but, considering the frequency with which tuberculous disease is recovered from, and the frequency with which healed tuberculous lesions are found in the bodies of persons who have died from other diseases, the number must be very great.

Necessity of a Combined Effort for Dealing with the Disease.

When it is remembered that the duration of cases of phthisis and other forms of tuberculous disease is in most cases considerable (several months or years), that the subjects of phthisis are in most cases young or middle-aged adults, and are in many cases possessed of mental ability above the average, and that the majority of patients affected with phthisis die during the maximum wage-earning period of life, it is obvious that the financial loss to the community (to speak of nothing else) which is caused by phthisis and other forms of tuberculous disease must be enormous. Financial considerations alone—and this is putting it on a very low ground—demand that the public health and other authorities, the profession and the public, should combine in a determined effort to deal with the disease. In other words, it will pay—and pay well—to provide the means (compulsory notification; a central office; arrangements for the bacteriological examination of sputum; an efficient staff of inspectors, disinfectors, and district nurses; dispensaries, sanatoria, hospitals, etc.) which the most advanced medical thought recommends for dealing thoroughly and effectively with the disease.

Diminished Mortality in Scotland from Phthisis during the Thirty Years 1871 to 1901.

During the thirty years under consideration (1871 to 1901) the death-rate from phthisis in Scotland as a whole has fallen from 278 to 153 per 100,000 of both sexes; the diminution has been in all parts of the country, urban and rural, except in the insular rural districts. In the year 1901 the mortality from phthisis in Scotland was in the

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principal town districts 170, in the large town districts 151, in the small town districts 138, in the mainland rural districts 128, and in the insular rural districts 171, per 100,000 of both sexes.¹

The fact that in the insular rural districts the mortality from phthisis has not decreased during the thirty years from 1871 to 1901 (in 1871 it was 162, and in 1901 171, per 100,000) is probably in great part due to the deplorable sanitary conditions which exist in these districts, and more especially in the Outer Hebrides, as shown by Dr. Dittmar in his report on the sanitary conditions of the Lews. This shows the great importance of general sanitary measures in dealing with the disease.

The great decrease in the mortality from phthisis which has taken place in all parts of Scotland, except the insular rural districts, during the thirty years 1871 to 1901 is no doubt largely due to improved sanitation—using the term in its widest sense—and improved conditions of life, rather than to any measures specially directed against phthisis. It is probably also largely due, as Dr. Arthur Newsholme has suggested, to the segregation of cases of advanced phthisis in hospitals and work-houses. And here it should be stated that systematic disinfection, increased attention to cleanliness generally (the institution of laundries, etc.), and decrease of overcrowding, have been important factors in raising the *general* standard of health conditions.

The Crusade against Phthisis in Scotland.

During the past ten, and more especially during the past five, years there has been a great advance of opinion amongst the profession, the public, and the public health and other authorities, as to the true nature of phthisis and the measures which it is desirable and necessary to take in order to grapple with phthisis and other forms of tuberculous disease. In this connection the names of Dr. R. W. Philip and Dr. Leslie Mackenzie are deserving of prominent mention.

No better illustration could, I think, be given of the advance in professional opinion than the following: In May, 1899, in an address to the Fife Medical Association, I strongly advised the compulsory

¹ In the insular rural districts the uncertified deaths are very numerous—viz., in 1881 52.5 per cent., and in 1901 36.4 per cent., of the total deaths certified—very much more numerous than in other parts of Scotland. Many of these uncertified deaths are without doubt due to phthisis. Consequently, the mortality from phthisis per 100,000 is probably very much greater in the insular rural districts than these figures show.

In 1901 the percentage of uncertified deaths in the different parts of Scotland were as follows: All Scotland, 3.0; principal town districts, 1.9; large town districts, 1.4; small town districts, 1.6; mainland rural districts, 4.6; and insular rural districts, 36.4.

Principal towns=towns with populations over 25,000 till 1900, and over 30,000 in 1901. *Large towns*=towns with populations above 10,000 and below 25,000 till 1900, and below 30,000 in 1901. *Small towns*=towns with populations from 2,000 to 10,000. *Mainland rural*=population not accounted for in the other four groups. *Insular rural*=population of all the islands, with the exception of the towns of Lerwick, Kirkwall, Stornoway, and Rothesay, which are included in the small towns.

notification of phthisis. The proposal received very little support. In June, 1906, the Fife branch of the British Medical Association passed by a large majority a resolution advocating compulsory notification.¹ On October 25, 1906, the Town Council of Glasgow unanimously decided to adopt compulsory notification of the disease.

Circular of the Local Government Board.

On March 10, 1906, the Local Government Board for Scotland issued a most important circular on the Administrative Control of Pulmonary Phthisis. In that circular, which every medical man should carefully study, it is stated that "pulmonary phthisis (that is, tuberculosis of the lungs, or consumption) is an infectious disease within the meaning of the Public Health (Scotland) Act, 1897. . . . Accordingly, the sections of the Public Health Act applicable to other infectious diseases are equally applicable to pulmonary phthisis, and the obligation resting on the local authority to deal with and control infectious disease extends to pulmonary phthisis." In other words, the same measures (disinfection, isolation, and removal to hospital, etc.) which may be applied to the other infectious diseases may also be applied to phthisis.

The explicit statement by the Local Government Board for Scotland that phthisis is an infectious disease, and is included under the Public Health (Scotland) Act, 1897, is a most important step in advance—in my opinion the most important step which has ever been taken for the prevention of the disease in this country—and is a logical sequence of Koch's great discovery of the tubercle bacillus.²

But the circular requires, I think, some qualifications and explanations, for otherwise it may give rise to grave misunderstanding on the part of the profession and the public.

The circular does not, I think, sufficiently emphasize the fact that, although phthisis is an infectious disease, it differs from other infectious diseases included under the Act in many important particulars; and that many of the measures, such as rigid isolation, removal to hospital, etc., which are necessary in the case of most of the other infectious diseases, such as small-pox, scarlet fever, and typhus, are not necessary for the great majority of cases of phthisis.³

¹ See Supplement, *British Medical Journal*, August 4, p. 146, 1906.

² The circular has, as was to be expected, already done much good, and has stimulated the local authorities throughout Scotland. The following is an illustration in point: I understand that, as a result of this circular, twenty-nine local authorities—*i.e.*, all the local authorities in the three counties Dumfries, Kirkcudbright, and Wigtown—have combined to form and carry on (joint expense, joint management, etc.) a central phthisis hospital or sanatorium. This is the largest combination ever effected in Scotland, and will no doubt be followed by similar combinations in other parts of the country.

³ In their report for 1903 the Board did, in fact, emphasize this difference. The purpose of the circular of March 10, 1906, was, doubtless, to emphasize

As the circular points out, the infection of phthisis is, except in a comparatively small number of cases, limited to the sputum. Now, provided that the patient *will and does carry out* the necessary measures for the destruction or disinfection of the sputa, this source of infection can in most cases be easily and effectively controlled. But the administrative difficulty is to *get this done* systematically. As a matter of fact it is far from easy—in fact, very difficult in practice—and without compulsory notification and the necessary measures which must follow, if compulsory notification is to be effective and of administrative value (systematic inspection to see that the sputum *is* destroyed or disinfected, etc.), it cannot be systematically done.

The ideal to be aimed at is to *insure that every individual suffering from phthisis, so long as his sputum contains the tubercle bacillus, does destroy or disinfect his sputum; in other words, that every patient suffering from the infectious disease phthisis does carry out the necessary measures for making his particular case non-infectious.* Hitherto the attention of sanitary authorities has been chiefly directed to general sanitary measures. *What is now required is a systematic and concentrated effort throughout the country to deal with individual cases and patients.*

Again, phthisis differs materially from most of the other contagious and infectious diseases in this important particular—that it is only very slightly infectious and communicable directly from person to person.

It cannot be too clearly understood that there is little or no risk of a *healthy* person contracting phthisis from being in contact with a person affected with the disease, provided that proper precautions (with regard to cleanliness, ventilation, *the destruction or disinfection of the sputa*, etc.) are carried out. At the same time, it must be remembered that there is real danger in sleeping in the same bed or even in the same room with a patient affected with phthisis.

Consequently, many of the preventative measures which are necessary in the case of other infectious diseases—small-pox, scarlet fever, typhus, for example—are not necessary in most cases of phthisis. But in connection with this statement it must never be forgotten that phthisis is an infectious disease; that it is *always* due to the introduction into the body of the tubercle bacillus *ab extra*; that the tubercle bacillus is never, so far as we know, produced *de novo*; and that the chief source (practically speaking, the only source) of the tubercle bacillus (leaving the disputed question of bovine infection out of account) is the sputum from cases of phthisis.

Provided that a patient suffering from phthisis takes proper means to

the fundamental fact, which must form the basis of all administrative and preventative measures—viz., that phthisis is an infectious disease, and is preventable.

destroy or disinfect his sputum, he need not, in my opinion, be isolated from his fellows. He may be allowed to engage in business, to travel in cabs and railway carriages, to go to church, places of amusement, etc. It is only the "dangerous" cases, as I term them—the cases in which the patients will not or cannot (owing to their enfeebled physical condition, or other cause, such as overcrowding) take the necessary precautions—which require to be isolated and sent to hospital. *And this is, in fact, all that seems to be required under the Act* (except as regards Clauses 51, 57, and 59), and, so far as I know, all that the Local Government Board for Scotland insist upon.¹

Under Clause 59 of the Public Health (Scotland) Act, 1897, persons suffering from infectious diseases are rigidly prohibited from travelling in cabs, railway carriages, and all public conveyances. As the clause stands it applies to phthisis equally with the other infectious diseases, and no discretion is allowed to the local authority or their medical officer. In the case of phthisis (and indeed some other infectious diseases, such as favus) this clause is too drastic. *It is, I think, necessary that, in respect to phthisis, this clause should be modified.* All that seems to be required is to insert in this clause the same qualification which is inserted in Clause 56 (see footnote)—viz., "*wilfully* exposes himself *without proper precautions.*"

The so-called "school clause" (57) and the hotel clause (51) are also too drastic as applied to phthisis, and ought to be modified in accordance with the special requirements of the disease.

Compulsory Notification.

As regards the compulsory notification of phthisis, the Local Government Board states: "For the effective application of the Public Health Act to pulmonary phthisis, a system of notification is essential. In some localities a system of voluntary notification has been organized.

"But it is open to the local authority, with the approval of the Board, to add pulmonary phthisis to the list of diseases notifiable under the Infectious Diseases (Notification) Act, 1889. The Board will be prepared to give favourable consideration to any application for their

¹ The clause in the Act reads as follows: "56. (1) If any person (a) while suffering from any infectious disease *wilfully* exposes himself *without proper precautions*" (no italics in the original) "against spreading the disease in any street, public place, shop, inn, hotel, church, or any place used in common by persons other than members of the family or household to which such infected person belongs; or" (here follow other subheadings, which I need not quote) . . . "he shall be liable to a penalty not exceeding five pounds."

Now, since the personal precaution which is necessary in the case of phthisis is the disinfection or destruction of the sputum, it follows that phthisical patients who take the necessary (simple) measures for destruction or disinfection of the sputum *may* mix with their fellows, and go to church, theatres, etc.

approval, provided they are satisfied that the local authority are in a position and are ready to deal effectively with the cases notified to them. Notification of itself has no administrative value, and, unless it is to be followed by effective measures for curative treatment of the patients and for prevention of the spread of infection, the Board will not feel justified in approving of the compulsory notification of cases of the disease."

The last clause in this paragraph is, I think, unfortunately worded.¹ As it stands, it would seem to imply that, *unless effective measures for the curative treatment of all cases of phthisis* are provided by the local authority, the Board will not feel justified in approving of the compulsory notification of the disease. I presume that the term "local authority" means the local *public health* authority. In my opinion, the local *public health* authority should only *be obliged* to provide effective measures for the treatment of the *dangerous* cases which are compulsorily or voluntarily removed to hospital, and the great majority of these "dangerous" cases are advanced and incurable, though it is of course most desirable—in fact, essential—that sanatoria for the treatment and education of early cases should be provided and established in every sanitary district.

That notification is of comparatively little administrative value, unless it carries with it effective measures for the prevention of the spread of infection, everyone will agree.

There is one point with regard to compulsory notification which is of very great importance—viz., *that it makes no difference whatever as to the working of the Public Health Act*. This is not generally known, and has given rise to a great deal of misunderstanding. The Notification Act is a quite distinct Act. I understand that it neither increases nor decreases the responsibility of the local authority under the Public Health Act, 1897. All infectious diseases whatsoever can be dealt with under the terms of that Act, whether they are compulsorily notified or not. The Notification Act is, as I have said, a separate Act, and all that happens when a disease is added to the notification list is that the local authority then receive more systematic information. Seeing that the Local Government Board in their circular of March 10, 1906, have explicitly stated that phthisis is an infectious disease, and is included under the Public Health (Scotland) Act, 1897, the duty of dealing with the disease—*isolation, disinfection, etc.*—is, I understand, precisely the same, whether the disease is notified or not. I emphasize this point, for it seems to be a source of very widespread misunderstanding. The

¹ What the clause really means is, I presume, that compulsory notification *per se* is of little or no administrative value; that compulsory notification should not become merely a means of collecting statistics, but that it must be followed by and conjoined with effective means for preventing the spread of the disease. If the word "curative" were read as equivalent to "therapeutic," using that term in its widest sense, as opposed to mere printed directions and the like, it would perhaps more accurately represent the meaning which is intended to be conveyed.

following statement from the "Report of the Local Government Board for Scotland, 1902," p. xxxvi, makes this quite clear :

"Local authorities, moreover, are possessed of preventive powers apart from compulsory notification. There being no definition of the term 'infectious disease' in the Public Health (Scotland) Act, 1897, its application is left to the discretion of the local authority, as advised by their medical officer of health in accordance with the scientific opinions of the day, and is, consequently, not confined to the diseases mentioned in the Infectious Diseases (Notification) Act, 1889. It is, therefore, not necessary to make 'consumption of the lungs' notifiable under that Act *in order to entitle a local authority to do anything that they are authorized by statute to do for the prevention of infectious disease*" (no italics in the original), "or that they, as advised, may think it expedient to do in view of the peculiar conditions under which infectivity exists and becomes operative in the case of consumption."

"The education of persons suffering from consumption of the lungs, and of those in charge of such persons, as to the infectivity of the expectoration and the precautions advisable is very necessary, not only for the safety of others, but to protect the patient from being prejudiced by vague and exaggerated ideas as to apprehended risks. It appears to us, however, that these educative measures do not depend on compulsory notification, and may be efficiently promoted without it."

Voluntary Notification.

With regard to voluntary notification, I repeat what I stated seven years ago—viz., that compulsory notification is essential if a thorough and determined effort is to be made to grapple with phthisis and other forms of tuberculous disease. None of the objections which have from time to time been brought against compulsory notification are, in my judgment, of any real weight. Voluntary notification—which, after all, is merely a makeshift and a compromise—seems to me, as compared with compulsory notification, a mere trifling with the subject.¹

Bovine Tuberculosis.

If, as many authorities maintain, in opposition to the opinion of Koch, bovine tuberculosis *is* communicable to the human subject, and that infection by tuberculous milk, tuberculous butter, etc., *is* a fertile source of tuberculous disease in the human subject, it is obvious that restrictive measures are necessary to prevent bovine tuberculosis being conveyed to man, and that means should, if possible, be taken to stamp out tuberculous disease in cattle.²

¹ In my "Lectures on the Causation and Prevention of Phthisis, with Special Reference to Compulsory Notification" (Edinburgh : R. and R. Clark, Limited), I have considered the whole subject in great detail.

² In Scotland at the present time the chief regulation for preventing the spread of bovine tuberculosis to man is contained in Article 15 of the Order of 1885, as

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I have to thank Dr. W. Leslie Mackenzie, Medical Member, and Dr. F. Dittmar, Medical Inspector, of the Local Government Board, for information and advice regarding many of the subjects referred to in this paper.

Sanatoria, Hospitals, and Dispensaries for the Consumptive in Scotland.

The following list of sanatoria, hospitals, and dispensaries in Scotland which are exclusively devoted to the treatment of phthisis is (with one or two additions) taken from the Appendix to the Circular of the Local Government Board:

LIST OF SPECIAL HOSPITALS, DISPENSARIES, ETC., EXCLUSIVELY RESERVED FOR PULMONARY PHTHISIS.

Ayrshire	Glen Afton Sanatorium, New Cumnock.
Crieff Burgh	Ellerslie Sanatorium.
Dumfries Burgh	Small Sanatorium attached to Dumfries and Galloway Royal Infirmary.
Edinburgh Burgh	Royal Victoria Hospital for Consumption, Craigleith. Dispensary, 26, Lauriston Place.
Edinburgh County	Bonaly Cottage Sanatorium (five bedrooms). Liberton Cottage Hospital (advanced cases).
Forfar County "	Sidlaw Sanatorium, Auchterhouse.
Kincardine County (Upper Deeside District)	Nordrach-on-Dee Sanatorium, Banchory.
Kingussie Burgh	Grampian Sanatorium.
Kinross County	Ochil Hills Sanatorium, Milnathort.
Kirkintilloch Burgh	Lanfine Hospital for Incurable Consumptives.
Kirkmichael	Knocksaultoch Sanatorium, near Pitlochry, Perthshire.
Lanark Burgh	Bellefield Sanatorium (for Glasgow patients).
Peebles County	Manor Valley Sanatorium, Peebles.
Perth Burgh	Sanatorium, Kinnoull.
Renfrew County	Consumptive Sanatoria, Bridge-of-Weir.

NOTE.—A number of other sanatoria are in course of construction in different parts of Scotland.

amended in the *Circular respecting Tuberculosis* of the Local Government Board, dated October 19, 1899. That Article is as follows: "If at any time disease exists among the cattle in a dairy or cowshed, or other building or place, the milk of a diseased cow therein—(a) shall not be mixed with other milk; and (b) shall not be sold or used for human food; and (c) shall not be sold or used for food of swine or other animals unless and until it has been boiled."

"The word 'disease' as used in the above Article has hitherto had the meaning as given to it in Section 5 of the Contagious Diseases (Animals) Act, 1878. The effect of the enclosed Order is to extend this meaning for the purposes of Article 15, so as to include such disease of the udder of a cow as shall be certified by a veterinary surgeon to be tubercular. These purposes are to prevent the milk from a cow suffering from such disease from being sold or used for the food of man, or, unless previously boiled, for the food of swine or other animals. Article 15 applies to all milch cows, whether their owners are registered under the Order or not."

In Scotland public slaughter-houses are very common—very much more common than in England—and it has been found that where public slaughter-houses are established private slaughter-houses almost always *ipso facto* cease. The large number of public slaughter-houses in Scotland renders the inspection of slaughtered cattle by the medical officer of health or veterinary surgeon appointed for the purpose very much more easily carried out than in England.

In Ireland.

By SIR JOHN W. MOORE,

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No graver question affecting the welfare of the Irish people offers itself for solution in the opening years of the twentieth century than the management of tuberculosis in its various forms, but especially in that of pulmonary consumption. It is not going too far to assert that tubercular disease is sapping the very life of the Irish race in the fatherland of that romantic and attractive people.

The Magnitude of the Problem.

It is sad to think that, notwithstanding the advance of Preventive Medicine in recent years, the plague spot grows rather than shrinks. In his annual report on Vital Statistics for the year 1904 to His Excellency the Lord-Lieutenant, the Registrar-General for Ireland (Mr. Robert E. Matheson, M.A.) writes as follows :

"It is a grave responsibility which devolves on me to report to Your Excellency that the death-rate from the aggregate of all forms of tuberculous disease has again reached the maximum of 2·9 per 1,000 of the population of Ireland, estimated to June 30, 1904 (4,402,182). . . . This high rate was also reached in the years 1880, 1897, 1898, and 1900. The annual rate of 2·9 per 1,000 represents the deaths of 12,694 persons (of males 6,257, and of females 6,437) during the year.

"The death-rates for the provincial areas from all forms of tuberculous disease were: For Leinster, 3·3 per 1,000; for Munster, 2·8 per 1,000; for Ulster, 2·9 per 1,000; and for Connaught, 2·0 per 1,000. In the county boroughs of Dublin and of Belfast the rates for deaths from all forms of tuberculous disease were respectively 4·7 per 1,000 and 4·1 per 1,000 of the estimated populations of these cities; and for the counties containing the county boroughs of Cork, Limerick, Londonderry, and Waterford, the rates for all forms of the disease were respectively 3·4 per 1,000, 3·0 per 1,000, 2·8 per 1,000, and 3·1 per 1,000 of the populations of these counties, according to the census of 1901.

"It may be here observed that the deaths from this disease in Ireland in the aggregate amount to 16 per cent. of the total deaths from all causes for the year 1904."

The Registrar-General goes on to show that there were in 1904 9,833 deaths (of males 4,817, and of females 5,016) in Ireland from tuberculous phthisis and *phthisis*, the total (9,833) representing a rate

of 2.23 per 1,000 of the estimated population. From these figures it appears that, of the total deaths (12,694) registered from tuberculous disease, 77.5 per cent. were from the pulmonary form of the malady, and that the percentage among males (77.0) was a little lower than that among females, the percentage of deaths among the latter being 77.9.

In a striking diagram, facing p. 17 of the report, a comparison is shown of the rates representing the total deaths from all forms of tuberculous disease in Ireland, as compared with England and Scotland, from the year 1864 to the year 1904. It will be observed from this diagram that, while in England the rate of mortality has fallen from 3.3 per 1,000 for the year 1864 to 1.7 per 1,000 of the population for the year 1903, and while in Scotland the rate has fallen from 3.6 per 1,000 in 1864 to 2.1 per 1,000 in 1902, in Ireland the death-rate from all forms of tuberculous disease has risen from 2.4 per 1,000 of the population in 1864 to 2.7 in 1902, 2.8 in 1903, and 2.9 per 1,000 in 1904.

Such are the facts relating to the death-rates from tuberculosis in Ireland. But, startling as it is, the death-roll represents but a small part of the havoc wrought by this dread infection. First, we must remember that tuberculosis is a chronic disease, killing its victims by inches. On an average, a consumptive lingers for two years; other forms of tuberculosis than pulmonary consumption last much longer. At all events, we may take it that at a given time not fewer than 30,000 human beings in Ireland are suffering from tuberculosis in one form or another. Next, the greater number of these unfortunate people are centres of infection to their neighbours. Lastly, most of them in the matter of age are in what ought to be the prime of life, with all its duties in the home and to the State.

Provision for the Consumptive.

The question naturally arises, What steps have been taken to cope with so grave a national danger?

In a paper on "Tuberculosis: its Prevention and Cure," which I read before the Section of Medicine at the Carlisle meeting of the British Medical Association in 1896, I stated that the hospital treatment of tuberculosis should resolve itself into providing of—

1. *Consumption Hospitals or Sanatoriums*, in which the disease could be treated in its earlier and more hopeful stages.
2. *Special Consumption Wards* in general hospitals, into which tuberculosis, and that disease alone, should be received.
3. *Refuges* for those far advanced in or dying of consumption. The German name for such an institution is very expressive—"Friedensheim," or "Home of Peace."

To the foregoing I would now add:

4. *Dispensaries for Pulmonary Consumption.*—On the occasion of a recent visit to Lisbon, I observed near the landing-stage on the river front of the Tagus a handsome new building of granite, bearing the inscription, "Assistencia dos Tuberculosos." This association was founded in 1899 at the initiative of Queen Amelia, who is its patroness. It includes a dispensary for tubercular patients. The objects of this dispensary are: (1) To give gratuitous advice to individuals attacked by tuberculosis, or suspected to be infected by or simply predisposed to the disease; (2) to classify these individuals according as they may need treatment in one of the hospitals of the association or in a similar institution; (3) to supply patients with remedies or means adapted for the treatment or prevention of tuberculosis, and to distribute to them other material assistance; (4) to record the facts which present themselves in the dispensary practice, and which may in some way or another be of interest in relation to the mission of the association.

I rejoice to see that the advisableness of providing dispensaries for pulmonary phthisis in towns and other thickly-populated localities has been urged by the Local Government Board for Scotland in an admirable memorandum on the "Administrative Control of Pulmonary Phthisis," dated March 10, 1906. In that all-important circular letter addressed to the local authorities of Scotland, and also sent to the various medical officers of health throughout that country, the work of a phthisis dispensary is set out in detail; and the statement is largely based on the experience gained in the Royal Victoria Dispensary for Tuberculosis, Edinburgh, organized by Dr. R. W. Philip, which has worked successfully for eighteen years. The Local Government Board points out that the municipal or district phthisis dispensary ought to be the central bureau of information. It should keep a register of all sanatoria, hospitals, infirmaries, work colonies, convalescent homes, parochial hospitals, private houses, phthisis committees, and all other institutions or organizations that, either within the district or without, can be made available for the inhabitants.

Available Measures in Ireland.

The existing provision for dealing with the tuberculosis problem in Ireland is altogether inadequate. Pulmonary consumption and other (as it were) captive, and therefore less diffusible and less infectious, forms of tuberculosis are still treated in the wards of the general hospitals in Dublin and other cities. In most cases it has been found impossible to tell off special wards for consumptive patients, and, much against their will and better judgment, the members of the hospital staffs find themselves constrained to treat such patients in the ordinary chronic wards.

In some of the Poor Law Unions—notably those of North and

South Dublin—special wards are now set apart for the reception of consumption, and the cases are classified according to the stage of the disease. The Belfast Board of Guardians have provided accommodation for eighty patients in their new sanatorium, and have borrowed £80,000 to increase the number of beds therein to 250. In Cork, the Joint Hospital Board, appointed for the purpose, have chosen a site for a proposed sanatorium, and the work of erection will shortly be commenced. In Clonmel also a movement has begun for the provision of a sanatorium for the poor of that district. In the Irish metropolis, the Dublin Branch of the National Association for the Prevention of Tuberculosis in November, 1905, adopted a resolution suggesting that the Public Health Committee of the Corporation of Dublin should summon a conference of representatives of the various urban and rural district councils in the metropolitan area, with the object of considering whether the establishment of a sanatorium for the treatment of pulmonary tuberculosis for the said area is feasible. Acting on this suggestion, Sir Charles A. Cameron, C.B., Medical Superintendent Officer of Health for the City of Dublin, as secretary of the Public Health Committee, obtained the sanction of the Corporation to summon such a conference. It has already met on more than one occasion, and the result of its deliberations will soon be made public.

Hopeless cases of consumption are taken into the Royal Hospital for Incurables, Donnybrook, co. Dublin; Our Lady's Hospice for the Dying, Harold's Cross, Dublin; and the Rest for the Dying, Camden Row, Dublin.

Early and promising cases are received at the Royal National Hospital for Consumption, Newcastle, co. Wicklow, where increased accommodation for patients has recently been provided. But the available number of beds does not exceed 103, and a minimal charge of seven shillings per week for each patient must sometimes debar a poor consumptive from reaping the benefits of this splendid institution, standing on its own extensive grounds, midway between the mountains and the sea, in the "garden of Ireland," as the county of Wicklow has been called.

The Control of the Irish Consumptive Poor.

The direct measures which should be taken in Ireland to cope with tuberculosis are embodied in a resolution which was unanimously adopted at the fifth annual general meeting of the Dublin branch of the National Association for the Prevention of Tuberculosis, held at the Mansion House, Dublin, on Tuesday, April 10, 1906, Mr. William Field, M.P., in the chair. This resolution reads as follows: "Resolved, that this meeting views with grave concern the continued prevalence of consumption and other forms of tuberculosis, especially in Ireland, and

urges, with a view to the prevention of these diseases—(1) the adoption of a system of compulsory notification of consumption; (2) the establishment of a public bacteriological laboratory, in order that the aid which science can render in the diagnosis of disease may be placed at the disposal of the poor; (3) the provision for isolation and curative treatment of sanatoria for the poor by the sanitary authorities; (4) the establishment of dispensaries for consumptives in the larger centres of population; (5) the prevention of spitting in public buildings and vehicles."

There can be no doubt that the five measures suggested in this resolution would constitute an effective and practical "plan of campaign" in the crusade against tuberculosis. As to the last suggestion, railway and tramway companies possess adequate powers to check the evil of spitting under by-laws sanctioned by the Board of Trade in 1903. In the police-court at Kingstown, co. Dublin, on March 22, 1906, a man was fined £2 and costs for persistently spitting on a tramcar running from Dalkey to Dublin and for pulling the trolley off the overhead wire when leaving the car. In the Northern Police-Court, Dublin, on Tuesday, June 19, 1906, a man was fined 10s. and costs for spitting in one of the cars of the Dublin United Tramways Company on June 6.

A few successful prosecutions like these must have a wholesome and deterrent effect in checking a dangerous and disgusting habit, which is too often practised, not only in public conveyances, but also in public-houses and other places of popular resort. But, to quote the memorandum of the Local Government Board for Scotland already referred to, "direct prevention should go hand-in-hand with general sanitation."

From 1861 to 1903 pauperism declined in England and Wales to the extent of 54 per cent., in Scotland by 52 per cent. In Ireland, on the other hand, pauperism increased in the same period by 119 per cent. Dr. Arthur Newsholme, Medical Officer of Health for Brighton, has shown in a recent paper that in each country in which institutional (or indoor) relief has replaced domestic (or outdoor) relief of destitution there has been a reduction of the death-rate from phthisis, which is roughly proportional to the change.

Poverty favours tuberculosis, according to the same writer, not so much owing to a deficiency of food or of wages, as in consequence of a deficiency of those sanitary measures which increase the resistance of a population to disease. Such sanitary measures are: (1) Improved housing of the people, including air-space and ventilation. (2) Subsoil drainage. (3) The provision of "damp-proof courses" in all new dwelling-houses. (4) Ventilation and cleanliness in factories and workshops. (5) Protection of workpeople against the inhalation of dust.

(6) Personal cleanliness. (7) Temperance in respect of alcohol: for intemperance is a vice which strongly predisposes to tuberculosis by lowering the vital powers and the resistance of an individual to infection. Nor should it be forgotten that the same vice causes poverty and increases pauperism. (8) The strict sanitary supervision of food-stuffs, especially of milk.

Such in outline are the measures which directly or indirectly are likely to control tuberculosis—that dread infection which is so well called the “white plague.” When it has been so controlled, Preventive Medicine will have fought its most decisive battle and won its crowning victory.

ORIGINAL PAPERS.

ON TUBERCULOSIS AND NATIONAL
EFFICIENCY.

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THERE is a great deal of truth in the adage "Evil is wrought by want of thought as well as by want of heart," and many evils are allowed to remain because people will not take the trouble to think how great they are or how very simply they might be removed. Amongst the most crying of such evils is the existence of consumption in this country.

The Tuberculosis Mortality.

The mortality it causes is awful; the misery it causes to its victims and their families is appalling; the actual expense, and still more the loss of productive power, which it entails upon the country is enormous. And yet the whole of this evil is perfectly preventable; it only exists in consequence of ignorance and apathy. If the whole people of this country would only awake to the mischief which is being wrought by this dreadful disease, and would bestir themselves to remove it, in the course of one generation consumption would be as rare among us as leprosy is now. What should we think of a general who ranged all his prisoners in line and shot down every tenth man, quite irrespective of who the man might be or what he might have done? Nor would he be held guiltless on the plea that he had not commanded the massacre himself, but had only allowed his subordinates to do as they pleased. A universal cry of horror and execration would be raised against him, and he would be considered unfit even to live. And yet we do this, and even worse, for we allow consumption not merely to decimate the people, but to kill every seventh person. Nor are we guiltless if we say that we have only allowed this massacre to go on, and have not actively helped in it. Surely it is time for us to bestir ourselves and to stop it.

Human Disablement from Tuberculosis.

But the mortality it causes, appalling though it be, is perhaps not the greatest evil wrought by this disease. A soldier who is disabled by wounds is a greater loss to the army to which he belongs than one who is killed in battle. For the man who is killed outright can no longer fight, and therefore ceases to help his companions; but he does not

interfere with their work, nor make any demands on them beyond the slight labour required to bury him. But a man disabled by wounds is nearly as great a loss as two men shot, for in order to give him the help he needs, others must give up their combative duties for a time, and horses, waggons, and railway-vans are taken up in the conveyance of the wounded and of hospital stores, when they may be urgently needed for the carriage of ammunition.

The loss thus incurred is serious enough, but few begrudge the trouble and expense if the wounded man can be restored to health. But the misfortune is still greater if he is permanently disabled, and must live the rest of his life, whether it be long or short, not only useless to others, but a burden upon them. It is very hard, perhaps impossible, to estimate what the loss is which is caused to the country by the disablement of a very large proportion of the population by consumption. It must be enormously great, for almost every person who dies of consumption is disabled for many months, sometimes years, before death; and, according to Richat,* whilst the death-roll of all the wars of the nineteenth century may be estimated at 14,000,000, that of consumption within the same period and countries would reach 30,000,000. Moreover, to quote again from Dr. Huber:¹ "It is during adult life that consumption achieves its fell work—in the periods when young people should entertain wholesome anticipations of matrimony; when husbands should be strong to work for and maintain their families; when wives should have strength to rear their children; and when men and women generally should have physical and mental capacity, so that they may accomplish the world's work. One-eleventh of all the pauperism, costing in England and Wales £10,500,000 a year, arises from consumption; one-quarter of all deaths during the wage-earning period (fifteen to fifty-five years of age) are due to consumption, leaving many widows and children to receive aid from poor laws, friendly societies, and charity organizations."

I have not personally investigated the statistics on which these statements are based, but even if rigid criticism should somewhat reduce the figures, enough remains to show that, even if we should throw all humanity aside and should be utterly destitute of patriotism and careless of the condition of our country, it would be worth our while to abolish consumption for the mere purpose of saving ourselves from paying the large rates and taxes which it entails.

The Elimination of Tuberculosis.

That it can be abolished is shown by the fact that with increasing knowledge and increasing care it is diminishing. The Registrar-

* Quoted by J. B. Huber, "Consumption and Civilization," Philadelphia and London, 1906.

TUBERCULOSIS AND NATIONAL EFFICIENCY 43

General's reports show the deaths in England and Wales to be in the decade 1881-1890 :

Total deaths	...	...	...	...	5,244,771
Deaths from phthisis	...	...	...	...	473,968
Deaths from other forms of tuberculosis...					190,995

Total deaths from all tuberculous diseases	664,963
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In the decade from 1891-1900 :

Total deaths	5,575,375
Deaths from phthisis	426,224
Deaths from other forms of tuberculosis...					189,782

Total deaths from all forms of tuberculous disease	616,006
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From these tables it appears that the deaths from phthisis have sunk from 1 in every 11 in the earlier to 1 in 13 in the later decade, and the total mortality from tuberculosis from over 1 in 8 to less than 1 in 9.

What are the causes which have brought about this remarkable and desirable change? I think there can be little doubt that it is due to Koch's discovery of the bacillus of phthisis, to more general recognition of the infective nature of the disease, and to improved methods of treatment. Phthisis is not infectious to the same extent as many other diseases—*e.g.*, measles, small-pox, and scarlet fever; the infectious matter is not given off from the surface of the body, nor even in the breath, but is contained only in the expectoration or discharges from parts locally infected with tuberculosis. If means are therefore taken to prevent the sputum from being scattered about by spitting or coughing, or transmitted by contact—*e.g.*, by kissing, by drinking-vessels, or contaminated fingers (*e.g.*, after handling handkerchiefs)—there is comparatively little risk of the disease being transmitted from the patients to their friends, and there is no sufficient ground for the selfish alarm which sometimes leads to the banishment of patients from their homes. But while the examples of such alarm are few, the amount of carelessness, dirt, dust, and darkness is enormous; and so long as the sputum of patients is not carefully collected and disinfected, so long as they expectorate anywhere, and the dried sputum is carried as dust by the wind abroad or draughts in houses, and so long as the houses themselves are unventilated and dark, so long may we expect the disease to exist.

The Arrest of Tuberculosis.

Sunlight and fresh air are the enemies of the tubercle bacillus, both inside and outside the body, and the greater the amount of both in houses, in workshops, in manufactories, and surrounding the patients themselves, the better for the prevention and cure of the disease.

Formerly patients suffering from phthisis were cooped up in close rooms, from which every breath of air was excluded, or they were sent to a soft, warm climate, such as Madeira or Malaga, in order that no cold should increase their distressing cough. Under such conditions they sometimes passed away more easily than they would otherwise have done, but with few exceptions they did not recover. Of late years this plan has been, to a great extent, abandoned in favour of open air night and day, either on the Swiss mountains, the hills of the Black Forest, or in this country, and now many cases which would formerly have been regarded as hopeless recover.

The reason why these recoveries take place is that, instead of trying to combat the disease by alleviating symptoms, as formerly, or by attempting to destroy the tubercle bacilli by disinfectants or anti-toxins, we now try to strengthen the organism by open-air exercise and feeding, so as to enable it to resist the disease.

This method of treatment is the best we possess as a means of cure, but in many cases, unfortunately, nothing avails to save the patient if the disease is advanced. It is in the early stages that it proves so useful and saves many lives which would otherwise have been sacrificed. The provision of sanatoria, both for rich and poor, is not useful only by providing the conditions of cure during the residence of the patient in them: for, unfortunately, the cure lasts a long time, and whilst its duration may be reckoned in years, the stay in a sanatorium of poor patients is more often to be reckoned in months, or even in weeks. But the sanatorium gives to the patients a practical knowledge of what they are to do and what they are to avoid in order to recover, such as no words printed or spoken could give them; and after leaving they are able, at least to some extent, in many cases to carry on the mode of life they have learned in the sanatorium.

Preventive Measures.

But prevention is always better than cure, and the same measures which enable the organism to throw off the disease strengthen it also to resist its invasion. The bacillus of tubercle is of slow growth, and does not find a nidus in a perfectly healthy body, with healthy lungs and good supply of fresh air. Very few nurses in consumptive hospitals are ever attacked by the disease, for women with healthy lungs are selected for the work. But even healthy lungs may become weakened by want of exercise or by some infective disease. It is the apex of the lung—the part which is least expanded in respiration— which is usually affected first by consumption, and it is after other parts of the lung have been weakened by pneumonia, measles, whooping-cough, and the like that they become liable to attack. For this reason measles, whooping-cough, and the like should be prevented from spreading among children,

and this might to a great extent be effected by efficient medical supervision of schools. Expansion of the lungs should be favoured by breathing exercises and by games in the open air; but playgrounds and open-air spaces are necessary for these, as well as teachers to show children and youths what to do. Imperfect feeding weakens the whole body, the lungs included, and thus proper food, especially for infants and growing children, is essential. Crowded homes, with dirt and want of sunlight, are hotbeds of consumption, and therefore slums ought to be cleared away and decent accommodation provided.

Co-operation and Co-ordination.

But this is an enormous work; and how is it to be done? The answer to this question is that it can only be done, like so many other things, by a long pull, a strong pull, and a pull all together, and perhaps the last part—viz., a pull all together—is the most important. It must be effected by the whole population of the country taking part—by every man, woman, and child doing his or her share of the work. But this is impossible, unless they know what to do and how to do it. As it is, many—very many—philanthropic societies and individuals are working for the purpose of lessening the death, suffering, and sorrow caused by consumption, as well as for improving the general health, happiness, and welfare of the people. But most of them are working in ignorance of what the others are doing, and in order to remedy this defect the National League for Physical Education and Improvement has been formed. Its object is not to displace any of the agencies at present at work, but to make them known to one another—to combine or associate them, so that each may not only do its own work, but may help others, and by combined action may effect what none could do alone. It is non-sectarian and non-political, and it hopes to unite in the good work managers and teachers in schools, parsons or ministers, doctors, mayors or provosts, corporations and philanthropic persons, especially ladies. Its objects are: (1) To save the babies; (2) to help and train the children and youths; (3) to strengthen the people physically, mentally, and morally, by improving the conditions in which they live. These objects it hopes to attain by combined action in caring for prospective mothers before confinements; by personal visitation and instruction after the birth of the child; by obtaining a pure milk-supply for towns; by promoting physical education in schools; by providing playgrounds, parks, or open-air spaces, swimming-baths, and gymnasia for children and youths, and drill-halls and rifle-ranges to occupy young men and give them higher interests than betting or beer-houses; clubs for girls; and such home accommodation for working classes as would lessen the attractions of the public-house for the men and the depression and weakness which want of air and sunshine cause to the women.

It is evident that in order to effect some of the desired reforms legislation may be required, and it will be much more easy to secure this by combined than by single action.

It is barely a year since this League was incorporated, but it has already done some good, for on February 27th, 1906, it sent a deputation to Mr. Birrell, Minister of Education, to ask that a medical man should be attached to each school, whose duty it should be to examine the scholars, so as to detect any disease, or even tendency to disease, in the children, and thus prevent its development, and to check the progress of any epidemic disease such as measles or whooping-cough, those fertile sources of consumption in children. To this Mr. Birrell has practically agreed, and although the National League cannot claim the entire credit of this, for it was warmly supported by other bodies, yet it was the first to bring the proposal before Mr. Birrell.

Two of the next problems to be attacked are the supply of pure milk and the teaching of hygiene in schools; for it is very difficult to get adults who have grown up in dirty, crowded, stuffy rooms to understand the merits of cleanliness and fresh air; and our hopes for the extinction of phthisis must be based upon the training of the rising generation in a knowledge of how to prevent it, rather than on any influence we can bring to bear on men and women now, though this ought not to be neglected.

I have tried in this paper briefly to show the enormous waste of life, money, and power caused to this country by consumption, and to indicate how it may be prevented by combined effort. Space has not allowed me to do more than give the barest outline of how the desired end is to be attained, but further information regarding the National League for Physical Education and Improvement may be obtained on application to the Secretary, Mr. Halley, 49 and 50, Denison House, Vauxhall Bridge Road, S.W.

CLIMATE AS A FACTOR IN THE TREATMENT OF TUBERCULOSIS.

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CLIMATE has been considered from the time of the ancients, especially the elder Pliny, as one of the principal means of cure of phthisis.

Early Conceptions.

Man had evidently always the half-instinctive idea that air played a great rôle in the cure of phthisis. I here use the term "phthisis"

because the pathology of the disease, as now expressed by the word "tuberculosis," was unknown to former generations. Many physicians held until quite recently the opinion that climate was, if not the only, at all events the most powerful, agent in the treatment of phthisis, and warm climates were especially in favour. With greater insight into the nature and causation of the disease, the influence of climate became to be considered of much less importance, and now it is regarded by many distinguished physicians as altogether indifferent in the treatment of the disease. This opinion I cannot accept, and I hope that to climate will be given again a fairer, though limited, share amongst the preventive and curative means of tuberculosis.

Pioneers in the Climatic Treatment of Tuberculosis.

As I write this short paper away from home and from books, provided only with a few extracts and statistics of my experience, I must abstain from literary citations, but I cannot help referring from memory to Drs. Archibald Smith, Spengler, Theodore Williams, Denison, Solly, Turban, and Huggard. For a more complete bibliography I may refer to the article on Climate in the second edition of the "System of Medicine" (vol. i., 1905), edited by Professor Clifford Allbutt and Dr. Rolleston.

Classification of Climates.

We will give here only a rough sketch of different classes of climates, their prominent characters, their physiological influences, and their applicability in the treatment of tuberculosis.

The broadest division of climates is that into the (A) *Marine* and (B) *Inland Climates*.

A. MARINE CLIMATES.

In the division of *marine* climates we include coast and insular climates and sea voyages. Although there are great differences in the different marine climates, they have more or less in common: (a) That the air is comparatively free from organic dust; (b) that the air is constantly renewed by the daily periodic air-currents; (c) that there is a greater equability of temperature between day and night as compared with the majority of inland climates; (d) that there is more movement of air, often amounting to strong wind, at the seaside compared with inland localities, a circumstance which is advantageous to most people, but disadvantageous to the majority of persons suffering from tuberculosis of the lungs.

The marine climates may be broadly subdivided into—(1) warm and rather dry climates, with great differences between sun and shade temperatures, of which the Western Riviera forms a type; (2) warm and humid climates, with rather equable temperature, which include

Madeira, the Azores, the Canaries, and West Indies; (3) climates with cooler temperatures and moderate humidity, the best representatives of which are the climates of the sea-coasts of Great Britain and Ireland.

1. The first group was in former years—especially the second half of the nineteenth century—strongly recommended for pulmonary tuberculosis, but has lost much of its reputation, partly in consequence of the fact that patients are surrounded by pleasure-seekers, and do not place themselves under strict medical guidance. The abundance of sunshine, the grandeur of the scenery, and the beauty of the vegetation, exercise an exhilarating effect on most persons, and, owing besides to the shelter from cold winds, patients in the initial stages or with quiescent disease can enjoy much open-air life and derive great benefit under strict guidance. To this group may be attached, though with less shelter and rather more humidity, the Eastern Riviera, the coasts of Southern Italy, of Sicily, Spain, Corfu, Algiers, and Corsica. The two last-named localities, however, owing to their more humid air, approach in these characters the next group.

2. The second group is more suited to weakly constitutions, with defective tissue metabolism and heat production, with irritable mucous membrane of the respiratory tract, with or without emphysema, and with tendency to laryngeal trouble. This group ought to be avoided by patients with relaxed mucous membrane and inclination to diarrhoea.

3. The third group, represented by the coasts of Great Britain and Ireland, offers considerable variety of characters, some more for summer—especially the drier and bracing East Coast; others more for winter, as the South-West Coast; some more tonic, others less; none really relaxing. Comparative absence of sunshine is the main drawback, and this renders a change to a sunnier climate desirable for those persons whose mental condition is depressed by the deficiency of sunshine.

Sea voyages were often prescribed to tubercular patients, especially up to the third quarter of the last century. They act beneficially in some persons of strong constitution in the first stage of pulmonary tuberculosis and in strong quiescent cases; but long sea voyages (to Australia and back) have an injurious effect on almost all weakly patients. The majority of the advantages of long sea voyages can mostly be gained more safely by other climates, excepting in enthusiastic lovers of the sea. Persons inclined to hæmoptysis often suffer seriously during the passage through the hot zones.

B. INLAND CLIMATES.

The inland climates may be divided into—(1) those of *elevated regions*, and (2) those of *slight elevation (lowland regions)*.

1. Under the term of climates of *elevated regions*, or *mountain climates*,

a great variety of localities are included. The degree of elevation which is necessary to produce the characteristic qualities of mountain climates varies considerably according to the degree of latitude. In tropical and subtropical regions an elevation of 8,000 to 6,000 feet above sea-level is required, while in temperate zones 3,000 to 1,000 feet are sufficient, and sometimes even less, to produce many, though not all, the characteristics of mountain climates, which to some degree are manifested by the nature of the vegetation.

These characteristics are—(1) low barometric pressure, which is necessarily associated with proportionate rarity of air; (2) low degree of air humidity; (3) low shade temperature; (4) high sun temperature; (5) great diathermancy; (6) great intensity of light; (7) rarity of mists; (8) purity of air (asepticity), especially with regard to microbes, which are destroyed by the intensity of light and the free circulation of air (Pasteur, A. Ransome, Metchnikoff).

The *physiological effects on man* are different according to age and constitution, especially the blood-making and resisting power, but may be roughly signalized as—(a) Deeper inspirations; (b) strengthening of the respiratory muscles; (c) strengthening of the heart and all the organs of circulation; (d) increase of the amount of air inhaled; (e) increased excretion of carbonic acid and water through the lungs; (f) increased afflux of blood to the lungs and integuments; (g) improved action of the skin; (h) augmentation of appetite and digestive power; (i) amelioration of sanguification (hæmoglobin and red corpuscles); (k) improvement of the nutrition of all organs, especially the lungs; (l) raising of the functions of the nervous system. We may say that the mountain climates are decidedly tonic to those who have a certain amount of resisting power, but that they are not borne well by feeble persons, who are defective in tissue change and in the production of heat.

As to the influence on tubercular patients, it is difficult to compare the effects of mountain climates with those of low regions, including marine climates; but as far as my own experience goes, the advantage is distinctly in favour of mountain climates. Excluding cases treated in sanatoria, and taking them without selection of specially favourable cases, I find that out of 100 patients affected with pulmonary tuberculosis in the first and second stage treated in mountain climates, 29 were cured, 41 improved, 16 remained stationary, 14 died. Of the same number of cases treated at low elevations, 22 were cured, 36 improved, 24 remained stationary, 18 died. The duration of treatment varied between five and thirty-eight months. As far as I recollect, the experience of Dr. Theodore Williams is slightly more favourable for the mountain climates.

We may say that these better results are due to climate, since

they were obtained, as already mentioned, either before sanatorium treatment had been introduced or in-patients who had not submitted to it.

That the air of highly elevated regions by itself, without special treatment, exercises a beneficial effect may be inferred from the fact that at Lima, on the coast of Peru, tubercular patients become mostly cured when they are sent up to the *Andes*, particularly to Huancaio and Jauja, 7,000 and 10,000 feet above sea-level. Dr. Archibald Smith, to whom we owe this information, has often had the opportunity of observing this during his long stay at Lima and at the silver mines of Corro Pasco, and I have been able to corroborate this in several of my own patients. A great advantage of these Andine climates is that there is very little change of temperature between summer and winter, day and night. It varies only between 14° and 18° C. (roughly, between 57° and 65° F.). We can only exceptionally make use of the *Andes*; but the Swiss Alps offer us several well-adapted localities with good accommodation, especially Davos, Arosa, and Leysin. These stations have during winter the great advantage of being covered with snow and entirely free from dust, of being almost free from wind and mist, and of having a large number of days of perfect sunshine.

Similar in some respects are the climates of the Rocky Mountains in North America (Dr. Denison and Dr. Solly), with the stations of Colorado Springs, Manitou, and Denver; but they are not always covered with snow, and are rather windy. The elevated regions of *South Africa* have likewise rather good claims (Dr. Symes Thompson), but they are often visited by high winds and sandstorms. In addition, we may mention that some localities of the Black Forest, the Giant Mountains (*Riesen Gebirge*), and other mountain chains in Germany, as also in France and England, possess some of the beneficial influences of the Alpine climates.

2. *Inland Climates of Slight Elevation.*—These localities include Egypt, many places in Europe, Canada, and the United States of America, as well as Asia Minor.

Egypt owes its climatic advantages entirely to the desert. The characteristics of the desert are—(1) great warmth; (2) wide daily ranges of temperature; (3) low relative humidity; (4) abundant sunshine; (5) small rainfall; (6) aseptic atmosphere. The different well-known health resorts—Assouan, Luxor, Mena House, etc.—share only to some degree the characteristics of the desert. Helouan alone may be regarded as possessing an almost pure desert climate. Cairo can at present not be regarded as a health resort, on account of its unhygienic condition. A disadvantage of Egypt for invalids is the occasional occurrence of high winds laden with sand-dust, which penetrates the clothes to the skin. Other drawbacks are the great

distance from home and the shortness of the season, which necessitates the migration, on account of heat, of the patients in spring to colder localities, which is not free from risks. In connection with Egypt we must mention the Nile voyage, which can be made either by the well-known steamers or by Dahabeya. The former is unsuitable to serious tubercular patients by the almost unavoidable exposure to wind and great variation of temperature in different parts of the vessel; the latter is more suitable, but very expensive. The climates of Egypt offer advantages to feeble constitutions requiring warmth and sunshine, and to complications of tuberculosis with emphysema and kidney diseases.

Amongst other lowland climates resorted to by tubercular patients we may mention Pau, Arcachon, Gardone Riviera, Arco, Meran, Botzen with Gries, which are all characterized more or less by a certain degree of stillness and purity of atmosphere. The majority of these localities have lost much of their former reputation, but can still be used with advantage in quiescent cases.

Practical Applications.

We will close this short survey of climates by a few notes on their employability in tuberculosis.

(1) It is of paramount importance always to ascertain the *constitution* of the patient, whether strong or feeble; this is even more important than the extent of the disease. Strong constitutions as a rule bear mountain climates with vicissitudes of temperature, and occasionally sea voyages; feeble constitutions require warm climates, with shelter from wind. This ought always to be kept in mind, whether the disease is quite recent and of limited extent, quiescent, or otherwise. (2) Cases with much pyrexia, even if the local affection is but slight, ought first to be treated near home, with avoidance of fatiguing journeys. (3) Cases of rather weak constitution, with chronic progressive disease and pronounced tendency to pyrexia, do, as a rule, best at dry, warm places, with limited exercise. (4) Similar cases of strong constitution, without great tendency to pyrexia, derive mostly more benefit from mountain climates, especially when the patients are young or in the prime of life. (5) Arrested cases with extensive affection feel best at warm seaside places, like the Western Riviera, but can also be treated with advantage at Bournemouth, the Isle of Wight, and the South-West of England, and at sheltered inland localities, like Pau, Arcachon, Gardone Riviera, Arco, and Meran. (6) Cases of tuberculosis with albuminuria ought to avoid high elevations and seek warm and dry climates, like Egypt and the Western Riviera. (7) Chronic cases with irritable mucous membrane and tendency to bronchitis require fairly warm places of medium humidity of air, like the Canaries, Madeira, and Algiers, but

can also be benefited by fairly windless inland localities, like Pau, Arcachon, Gardone Riviera, the South and South-West Coasts of England. (8) For chronic cases with much emphysema high places are not suitable; they require warm places, similar to those mentioned under (7). (9) Tuberculosis can often be cured in all climates, though certain climates possess advantages according to constitution and individual complications. (10) The blind confidence in climate alone without judicious management is dangerous. (11) Careful treatment in sanatoria is necessary to the majority of tubercular patients, and is most promising in the beginning of the disease. When an intelligent patient has, by residence in a sanatorium, learnt how to manage himself, he may continue the treatment out of sanatoria, and then the choice of a climate ought to be well considered. (12) Whenever it is possible to cure a case near home, this is preferable to the treatment abroad in a different climate, since it often is more or less difficult for persons treated in foreign climates to maintain their health on return to the home climate.

THE COMBAT WITH CONSUMPTION.

A Contrast.

BY SIR SAMUEL WILKS, BART.,

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As I look back to the commencement of a long professional career, no picture which presents itself to my mind is so melancholy as that of the complete impotence of the medical man standing before a case of consumption. But now this has happily passed, and a pleasanter outlook is before us. Probably the impression was intensified by seeing two of my family fall victims to this disease, whilst a third was completely cured by discarding all the old methods and adopting a course of treatment which was quite in accordance with the advanced principles of the present day. This made me also sceptical as to the value of drugs compared with the greater importance of following the natural laws of health.

My first master, Dr. Addison, in no way weakened this feeling, when I saw him give little medicine and at the same time heard him speak of the striking effect on such cases as typhus or scarlatina when brought out of squalid hovels into the airy ward of a large hospital. Also, in a graphic manner, he went on to tell us that when, as Physician to the Public Dispensary, he found a patient whom he visited with fever in some

small, close attic, his first remedy was to break one of the window-panes to allow the ingress of fresh air.

As regards consumption, which was carrying off the fairest and most promising youth of the land, nothing more was done for the victims than prescribing tonics and cough mixtures, with the occasional episode of ordering a red medicine whenever spitting of blood occurred. If a change of air was admissible, the patients might be sent to a warmer climate (as poor Keats was sent to Rome), although it often shortened their days. A superstition existed, which still largely prevails, that cold is the source of all ills and warmth is the cure. Hastings acquired its fame from being a town closely shut in between two cliffs, but it was soon found that Torquay or Bournemouth were to be preferred. The value of mountain air had not then entered into the conception of either doctor or patient. I am not at all dissatisfied with myself when I remember that from the very beginning of my practice, on being consulted about a young man in early consumption, I ordered him to give up his occupation at any cost, seeing that the special surroundings in which he had been living had been the cause of the development of the disease; and so he was to adopt an exactly opposite course of life, and to spend the whole of his day in the open air. If he preferred a thorough change, he might take a long sea voyage or spend a few months on the high land of the Transvaal. There was no mistaking the result when patients with marked pulmonary disease returned home in two years' time cured.

As all this occurred long before the discovery of Koch's bacillus, I considered that the result was due to pure air, good light, and sunshine, as was the opinion of those who had in former times extolled the value of these three so-called elements of Nature. Celsus recommended voyages in the Mediterranean for consumptives, and sunshine obtained in his *solaria* for some other complaints. The same methods were adopted by Hippocrates, and carried out to perfection in his sanatorium at Epidaurus, as so well described by Dr. Caton.¹ We cannot, too, but remember how the ancient races of mankind worshipped the sun as the giver of all that was good. They saw Phœbus rising in his power at the beginning of the year, and the whole living world being new created. It may well be thought that the worship of Baal was of the same nature, and that our own forefathers, the Druids, had the sun for their god, although it is a poor imitation of their adoration when travellers meet at Stonehenge on Midsummer Day and watch for the sun's rising over the great altar-stone. It is a much more wonderful thought, after reading the grand and tragic story of Elijah putting to the sword the prophets of Baal on Mount Carmel, that we should,

¹ "The Temples and Ritual of Asklapios at Epidaurus and Athens": Two Lectures delivered at the Royal Institution by Richard Caton, M.D., F.R.C.P.

after the expiration of thousands of years, have erected a sanatorium for the cure of tuberculosis on this beautiful promontory on the Mediterranean; and that our patients now are asking for the blessings of Heaven, as did their forefathers the devotees of old.

To pass to more modern times, we have had our own Mead writing his work, "*De Imperio solis incorpore humano*." Our scientists tell us how the direct and oblique rays of the sun on our earth have originated the characters of the animal and vegetable world and produced the various races of men; they tell us also that previous to this epoch the sun was storing up its force in those carboniferous strata of the earth which we now use as our principal source of power in all the factories of the world; and they also inform us that if the sun were suddenly extinguished there would not be a particle of living matter, whether in the animal or vegetable world, at the expiration of six days.

The time had therefore arrived, and especially after the discovery of Koch that a specific bacillus or parasite lay at the bottom of the disease, that special treatment should be adopted. There were, however, men of experience and discernment who had already preached the value of the open-air treatment, and none more earnestly than Dr. Henry MacCormac, of Belfast. He wrote a treatise on the value of fresh air in consumption about half a century ago, and spent his life in enforcing his doctrines. What he says and repeats many times in his book is this:

"Here I must again declare that without the respiration day and night of a perfectly pure atmosphere we need not hope for success. A fresh, untainted, unprebreathed atmosphere, at all times and places, is the one condition of treatment which nothing must interfere with or set aside."

"The simple rule is to let the chamber atmosphere prove pure and untainted as is the open air itself, in which, indeed, the patient should otherwise spend as much time—in fact, pause as much—as his strength, the weather, the season, and his means will permit. He must, in short, live in the open atmosphere."

"The phthysical sufferer should spend as much time in the open air, in all seasons, as his strength and the weather will permit."

"Contrary to the general prepossession, I affirm that the air is as good, nay, better, by night than by day. Night air, as such, never injured anyone."

Having had no practical experience of the value of consumptive sanatoria, since these have all arisen after my retirement from the profession, I cannot speak of them personally; but always having believed that fresh air is the first or only remedy for consumption, I am quite prepared to accept all that is said in favour of their curative action, and all that is hoped for in the future.

TREATMENT OF HÆMOPTYSIS BY NITRITE OF AMYL.

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M.D.,

Late Consulting Physician, Brisbane General Hospital; and Visiting Physician, Diamantina Hospital for Chronic Diseases, Queensland.

In a recent article Dr. W. E. Dixon reviews the drugs most commonly used in this country for internal hæmorrhage, and shows that most of them—namely, “the tannins, adrenalin, digitalis and its allies, ergot, veratrine, barium, and lead—are all worse than useless for hæmoptysis.”¹ He concludes that morphia “will probably do more good than any other drug,” but speaks favourably of calcium chloride. He omits, however, any mention of the drug which, in the opinion of those who have used it, is by far the most powerful pulmonary hæmostatic of all—namely, nitrite of amyl.

The considerations which led to the employment of nitrite of amyl in hæmoptysis were almost solely physiological, and therefore *a priori*, or deductive. It was recognised—(1) that one essential factor in the pulmonary hæmorrhage was the existence at the bleeding-point of a certain intravascular pressure; (2) that this intravascular pressure might be reduced passively “by a fall of pressure in the left auricle, due to diminished resistance in the aortic outflow” (Schäfer²); and (3) that the resistance in the aortic outflow might be precipitately diminished through the promotion of widespread vaso dilation of the systemic periphery by means of inhalation of nitrite of amyl. Before the clinical test, then, it was anticipated that this therapeutic procedure would be followed by an immediate retardation, if not a cessation, of the bleeding. But, in accordance with the notoriously fleeting action of the drug, it was not anticipated that this result would prove of great practical utility.

In 1903 I published two cases of hæmoptysis (one mitral, one phthisical) treated by inhalation of this drug.³ These, so far as I can discover, were the first published cases so treated. Subsequently seven more cases (all phthisical) were published by me.⁴ In April, 1905, Professor Rouget published ten cases.⁵ In May, 1905, Dr. Horace C. Colman published one case.⁶ Early in the same year Professor

¹ Dixon, W. E., *Lancet*, March 24, 1906, p. 826 *et seq.*

² Schäfer, “Text-book of Physiology,” vol. ii., p. 150, Edinburgh and London, 1900.

³ Hare, F., *Australasian Medical Gazette*, October, 1903.

⁴ Hare, F., *Australasian Medical Gazette*, February, 1904. *Lancet*, August 20, October 1, and November 19, 1904; January 21, 1905. *Clinical Journal*, March 22, 1905.

⁵ Rouget, *Société Médicale des Hôpitaux de Paris*, April 20, 1905.

⁶ Colman, H. C., *Scottish Medical and Surgical Journal*.

Pic began to use the drug, and his cases, together with others by Leclerc, Lemoine, Mouisset, and Bourland, were published by the last-named in a graduation thesis, dated the following November.¹

Taken together, these various articles include about sixty attacks of hæmoptysis occurring in thirty-three patients. All the attacks were treated by inhalation of nitrite of amyl, and in every instance except one the bleeding ceased, or became reduced to a mere staining of the sputa, immediately—that is, within a minute or so. In the single exception published by myself the bleeding was greatly reduced, but continued for ten minutes, ceasing spontaneously. I have now no doubt that a larger dose—the dose given did not exceed 5 minims—or a second inhalation would have been completely successful. I cannot find recorded nor have I heard of any instance of complete failure, or a second instance of partial failure. In some of the published cases the hæmoptysis is referred to as profuse or even violent; in some it had continued for days, in spite of complete rest, morphia hypodermically, ergotin, chloride of calcium in large doses, ipecacuanha pushed *ad nauseam*, dry cupping, and the use of ice internally and externally.

Besides the above published cases, many others have been reported privately to me. Dr. C. Reissmann, physician in charge of the Kalyra Sanatorium, and of the department for advanced cases in the Adelaide Hospital, South Australia, fully confirms the action of the drug. He directs that all patients in both the institutions in his charge who have had, or may be expected to have, hæmoptysis should carry the drug about with them for instant use. This plan has now been in use for the last three years at the Jubilee Sanatorium and the Diamantina Hospital for Chronic Diseases in Queensland.

It has been stated that "the cessation of hæmorrhage after the exhibition of a drug is in itself no proof that the effect was produced by the drug."² This is doubtless true of the majority of drugs, more especially, of course, of those which act tardily. But it is obviously untrue of nitrite of amyl. The cessation of hæmoptysis after the exhibition of nitrite of amyl is definite proof that the effect was produced by the drug, for, as just stated, the effect is practically immediate and practically constant.

In a moderately severe case of hæmoptysis there is a definite periodicity in the expectoration of blood. The blood accumulates in the damaged lung tissue and bronchial passages up to a certain point, then cough is induced, and the accumulation expectorated. This recurs at short intervals. The time of election for the administration of the inhalation is immediately after the expectoration of a mouthful of blood. When so administered, the mouthful preceding the inhalation

¹ Bourland, "Traitement des Hémoptysies par le Nitrite d'Amyl," Lyon, 1905.

² Dixon, W. E., *Lancet*, March 24, 1906, p. 828.

is the last of the series; it is then seen that the bleeding has ceased synchronously with the flushing of the face. The succeeding cough brings up merely blood-stained mucus or muco-pus, and in the majority of cases even this staining rapidly ceases.

The duration of the subsequent freedom from bleeding came as a distinct surprise. Taking the nine cases published by myself, in five there was no recurrence; but in one of these—a very advanced case, in which there had been free hæmorrhage for some days—the patient died from exhaustion a few hours later. In four there was recurrence. In one of these the recurrence took place in half an hour; this marked the shortest period of freedom recorded. In the three remaining cases the recurrence was delayed for several or many hours, and, as already pointed out, was promptly stopped by a fresh inhalation. Whatever the duration of the reduction of blood-pressure induced by nitrite of amyl, it must, I think, be conceded that—in many cases, at least—it is sufficiently prolonged to permit of adequate coagulation at the site of the lesion.

There is obviously room for considerable variation in dosage. In my own published cases the treatment was, of course, tentative. For the most part 3-minim capsules were given; no single inhalation contained more than 5 minims. Such dosage probably errs on the side of caution. Professors Rouget, Pic, and others have frequently given 9 or 10 minims without disquieting result. It would seem that the dose should vary within the limits specified directly with the severity of the bleeding.

Most of the advantages of nitrite of amyl inhalations are obvious, and have been dwelt upon by the writers quoted in this article. They comprise—accessibility; safety and facility of application and reapplication even in the absence of skilled assistance; rapidity, constancy, and duration of action; and general applicability from the absence of all known contra-indications. But there is a further advantage, less obvious perhaps, but none the less important. Before using the nitrite I had in most cases of severe hæmoptysis used morphia hypodermically. Morphia acts as a respiratory sedative, markedly diminishing cough; and this action undoubtedly tends to the cessation of pulmonary hæmorrhage. But the blood already effused is more or less retained in consequence. Under the thermal and microbic conditions obtaining in the ulcerated lung tissue the retained blood tends to decompose, and thus not rarely is set up septic pneumonia, high temperature, and prolonged exhausting illness. The result may be fatal; but in any case the patient is put far back on the road to convalescence, along which under modern treatment he may have made great advance. In my experience the incident of hæmoptysis, not dangerous in amount, has thus proved a grave misfortune for many phthisical patients; but with nitrite of amyl

the septic danger is avoided. It is the influx of blood to the ulcerated lung tissue which is checked, not the efflux from the air-passages; nor does the drug interfere in any way with coughing. Hence the blood already effused is rapidly got rid of. Conformably, in none of my own cases was there the least subsequent additional rise of temperature; the interruption in the usual hygienic routine did not exceed a few days.

Until quite recently the mechanism of the action of nitrite of amyl already suggested has remained unquestioned; the drug has been supposed to act solely through a passive reduction of the pulmonary blood-pressure. But from a series of laboratory experiments, Soulier, Pic, and Petitjean have been led to claim that this undoubted indirect action is not the only, nor even the chief, hæmostatic action exerted.¹ The experiments were made on curarized dogs of from 15 to 20 kilograms in weight. The anterior portion of the chest wall is removed, and life maintained by artificial respiration. The lung thus exposed exhibits the normal rose colour. One cubic centimetre of nitrite of amyl is then injected into the isolated femoral vein. Quickly white patches commence to form on the lung. These increase in size, coalesce, and soon cover the whole surface: the lung has become exsanguine. The process commences ten seconds after the femoral injection. The exsanguine condition endures, with an intensity which is often extreme, for several minutes before it begins to lessen; nor does the lung resume its normal rose colour for from seven to ten minutes after the injection. No reactionary hyperæmia ensues.

The intensity of the pulmonary anæmia is gauged by the following experiment: Some seconds after the injection the lung tissue is snipped with scissors. Usually profuse hæmorrhage follows such an injury, but in the case of the dog under the influence of nitrite of amyl no single drop of blood issues from the wound. The action of the drug is so energetic that the observers compare it to that of an Esmarch's bandage applied to the lung. Further, they point out that it is obviously indicated in all wounds of the lung parenchyma, whether occurring in war, in the duel, or accidentally.

The above laboratory observations undoubtedly explain the duration of the hæmostatic action in cases of hæmoptysis. But Soulier, Pic, and Petitjean claim that they demonstrate also that nitrite of amyl causes, not only vaso-dilation of the systemic periphery with secondary anæmia of lung tissue from fall of blood-pressure, but also a direct concurrent vaso-constriction of the pulmonary periphery. And in further confirmation they assert that the passing anæmia of the lungs

¹ *Comptes rendus hebdomadaires des Séances de la Société de Biologie*, January 20, 1906, p. 131; also *Lyon Médical*, February 18, 1906, p. 309 *et seq.*; and thesis by Georges Bourland, entitled, "Traitement des Hémoptysies par le Nitrite d'Amyl," Lyon, 1905.

coincides with an actual rise of blood-pressure in the pulmonary trunk artery, as shown by careful manometric observation.

Whether or no the experiments quoted necessarily bear the above interpretation, I am myself incompetent to judge; but if they do—if it be accepted that nitrite of amyl checks hæmoptysis by inducing, *inter alia*, an active, energetic pulmonary vaso-constriction—it must not be forgotten that the vaso-dilation of the systemic periphery, and the consequent fall of blood-pressure, remain important factors in the hæmostasis; otherwise it would be impossible to explain the fact now amply demonstrated that nitrite of amyl operates quite as rapidly, though perhaps not quite so powerfully, to check hæmorrhage from many parts of the systemic circulation. Inhalation of the drug may completely stop the normal menstrual flow;¹ it is capable of checking menorrhagia for many hours together;² and it has proved successful in the reactionary hæmorrhage following removal of parovarian cysts, and in the hæmorrhage from ruptured extra-uterine gestation.³

¹ Hare, Francis, M.D., "Medical Treatment of Deep-seated Hæmorrhage," *Lancet*, August 20, 1904, p. 524.

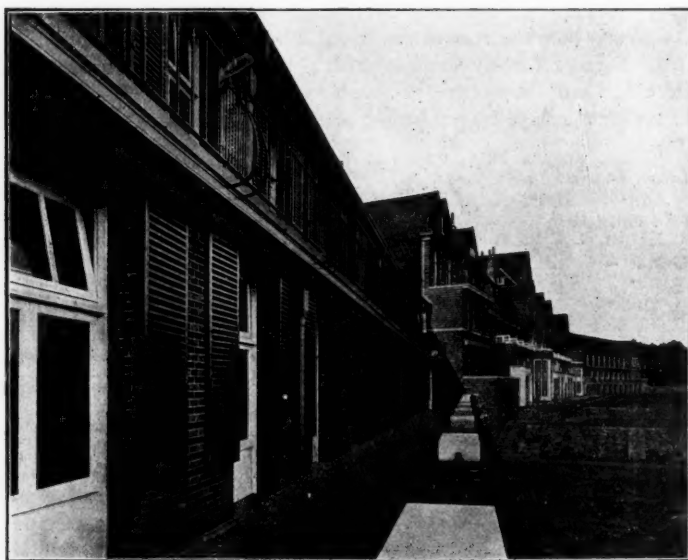
² Colman, Horace C., M.D., "Treatment of Menorrhagia, etc.," *Scottish Medical and Surgical Journal*, May, 1905, p. 390.

³ Moss, C. A. F., M.D., "Nitrite of Amyl in Gynæcology," *Lancet*, October 14, 1905, p. 1107.

INSTITUTIONS FOR THE TUBERCULOUS.

KING EDWARD VII. SANATORIUM, MIDHURST.

THE King Edward VII. Sanatorium is situated between Haslemere and Midhurst. It stands 495 feet above the sea-level in 151 acres of finely-wooded country overlooking the South Downs. Surrounding the sanatorium buildings, the grounds have been laid out in a series of



SOUTH FRONT.

(By kind permission of the "Architectural Review," and the "British Medical Journal.")

terraced gardens and lawns, which offer facilities for recreation and light work for the patients.

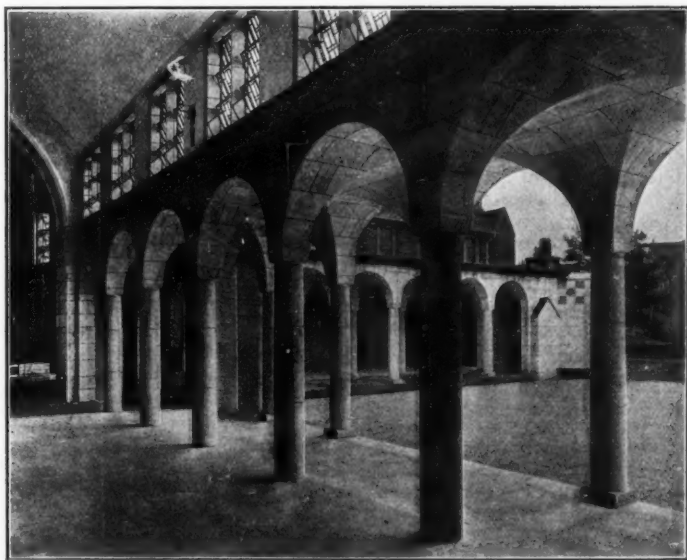
The sanatorium consists of: (1) the patients' block; (2) the administrative block; (3) the pathological block; (4) the laundry and engine-house block; (5) the garage and stables; and (6) the chapel.

The patients' block faces south, and is 700 feet in length. It consists of a ground floor, a first and second floor, and contains 2 large recreation-rooms, 2 hydropathic-rooms, 2 writing-rooms, 100 patients' bedrooms (50 men and 50 women), with 6 nurses' kitchens, linen-rooms, etc. The patients' bedrooms measure 13 feet 6 inches by 11 feet 6 inches, and are 11 feet high. The large windows open out

on to a balcony 8 feet in width. The furnishing of these rooms is of polished birch, and was specially designed for the sanatorium.

The dining hall is a handsome room, lined with Doulton Carrara ware, the floor being of stone, which can be heated from beneath. The kitchen is fitted with two ranges and a grill, and with a most improved steam-cooking apparatus, and the servery is fitted with "hot-plates" and boilers for making tea and coffee. There are separate pantries for the plate, crockery, etc., of the patients and staff respectively, and the patients' pantry is fitted with a sterilizer.

The medical rooms comprise a waiting-room, consulting-room, a well-appointed operating theatre and dark-room, and a dispensary. The administrative block also contains the board-room and the quarters



THE CHAPEL.

(By kind permission of the "Architectural Review.")

of the medical officers, matron, nurses, and the domestic staff. The pathological block consists of a post-mortem-room and three well-appointed rooms for pathological and research work. Researches which have a direct bearing upon the treatment of consumption will form an important feature of the work of this department.

The chapel is probably unique. It consists of two naves built at right angles to each other, with the chancel at the angle of the junction. The south aspect of each nave consists of an open cloister. The floor of the chapel is of stone, which can be heated from beneath.

In accordance with the commands of His Majesty the King, admission to the King Edward VII. Sanatorium is limited to those suffering from pulmonary tuberculosis in its early stages.

It is His Majesty's desire that the sanatorium shall afford accom-

modation for that large class of persons of slender means in professional and other employments for which no provision for sickness of this kind at present exists. It is also His Majesty's wish that those persons of larger means, who can afford to pay for treatment, should not be entirely excluded from the advantages to be derived from this institution, and it has been accordingly decided that a small number of beds shall be reserved for them.

Accommodation is provided for 86 patients who have small means (Class A), and for 14 patients who are well-to-do (Class B). Patients of both sexes are admitted.

NOEL D. BARDSWELL, M.D.

BROMPTON HOSPITAL SANATORIUM AND CONVALESCENT HOME, FRIMLEY.

THE Brompton Hospital Sanatorium stands on the Chobham Ridges, Surrey, 400 feet above sea-level, about thirty miles from London, two miles from Frimley Station, and three miles from Camberley.

Except on the south, which faces Frimley Common, the grounds are surrounded by the pine-woods of the Heatherside estate, which afford an excellent shelter to the sanatorium from north and east winds.

The soil is gravel and sand, and belongs to the Upper Bagshot series, and has a reputation for dryness.

The sanatorium is a two-storied block of stellate form rising into three stories in the centre, for the reception of one hundred patients. The central part includes the board and day rooms, the matron's apartments and pharmacy, and some of the larger wards, while the four radial pavilions contain the majority of the wards, which are principally single-bedded.

These face S., S.S.W. and S.S.E., and are so arranged that no portion of the building is shaded by another. The height of the wards is 10 feet, and the cubic space per patient about 1,300 feet. To afford additional safety in case of fire, in addition to the main staircases, there is a fire-escape staircase at the end of each pavilion, and, further, two of the pavilions are cut off from the rest of the block by a corridor of fire-resisting construction with a glass roof.

The wards are designed to have windows open day and night with protection from weather and glare, and the lower story is so arranged that patients in bed can be wheeled out on to the terrace, to be under the full influence of the sunshine and atmosphere. Open balconies are formed at the end of each pavilion.

Two detached sanitary towers on either side of the central building, and connected with it by gangways, contain the bathrooms, w.c.'s, lavatories, and housemaids' closets.

A separate group contains the two dining-rooms and a large recreation-room, and behind there are the kitchen and offices, and on either side, connected by covered ways, are the residence of the medical officers and the home for nurses. At some distance from the sanatorium is the machinery block, containing the boilers and engine-house, the laundry, the electric-lighting plant, the mortuary, and the laboratory.

The institution is lighted by electricity, and electric motive-power is used in the laundry. Hot-water radiators are fitted throughout the sanatorium. The water-supply is from the Frimley Waterworks, which

are at a short distance from the sanatorium, and the drainage is connected with the Frimley main drainage scheme.

Patients are admitted to the sanatorium and convalescent home from the wards at Brompton only, and the greatest care is exercised in selecting only those cases who are likely to derive the greatest amount of benefit from a prolonged course of treatment at the sanatorium, which often extends over several months.

The patients, under careful supervision, are gradually accustomed to exercises arranged in five or six grades, the lowest being simple walking, and the highest, at the present time, the digging of trenches in previously unbroken ground. No male patient has been considered



FRONT VIEW OF THE FRIMLEY SANATORIUM.

to present total arrest of the disease until all bacilli have disappeared from the expectoration, and medical examination has failed to detect any sign of active mischief, and also until he has performed the highest grade of exercise for a fortnight or three weeks without rise of temperature or loss of weight. Such hard work will rarely be required from the patients in after-life, and there is thus a strong probability that the arrest of the disease will be permanent. It is proposed, however, to obtain reports of the patients' condition from time to time after they leave the sanatorium, either from themselves or from medical men who may happen to examine them.

FREDERICK WOOD.

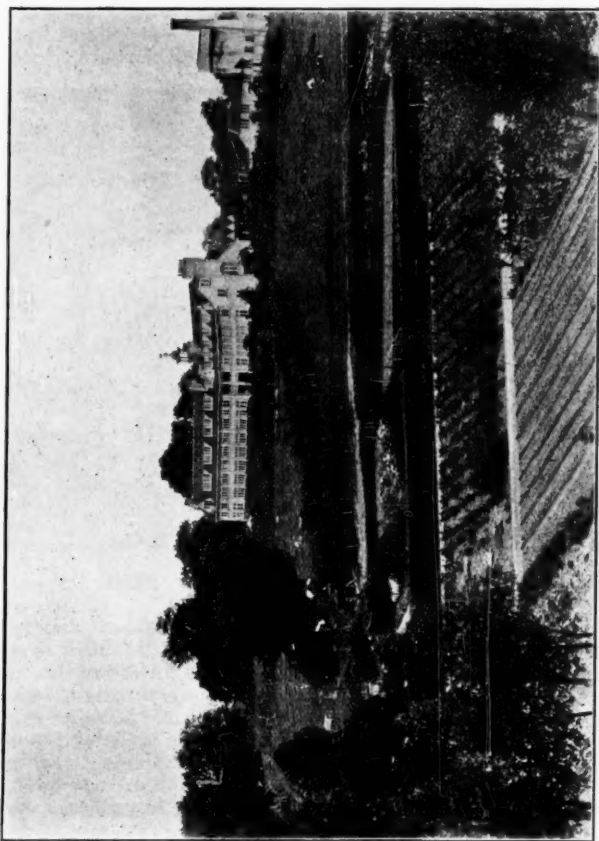
EAST ANGLIAN SANATORIUM, NAYLAND, SUFFOLK.

THIS sanatorium has been built specially for carrying out the open-air treatment. It faces south and south-east, and is built on dry sandy soil. The sanatorium estate is one of about a hundred acres, and there

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are large kitchen and flower gardens, well sheltered by trees and hedges, and also tennis and croquet lawns and a small golf links. Shelters are placed in various parts of the grounds for patients to lie or sit in during the day. The sanatorium has its own dairy-farm, electric-lighting plant, and laundry.

Patients suffering from all forms of tuberculosis are received, and



THE EAST ANGLIAN SANATORIUM.

also those suffering or recovering from other illnesses or surgical operations.

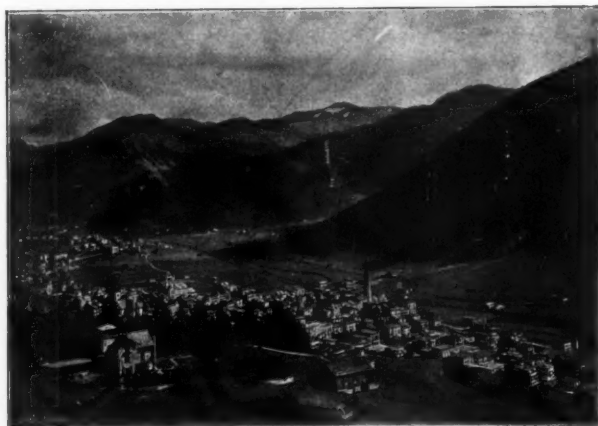
Special arrangements can be made for patients requiring rest-cures, Weir-Mitchell or spinal treatment, or Swedish or breathing exercises.

There is accommodation for thirty-five men and women patients, a resident medical officer, matron, and staff of nurses.

JANE WALKER, M.D.

HEALTH STATIONS.

DAVOS, SWITZERLAND.



DAVOS FROM THE SOUTH-WEST, WITH THE SITE OF THE QUEEN ALEXANDRA SANATORIUM IN THE FOREGROUND.

TOPOGRAPHICAL.

Davos is an upland valley in extreme Eastern Switzerland, in the watershed of the Upper Rhine, parallel to and about fifteen miles west of the Engadine. The valley is ten miles long, runs from N.N.E. to S.S.W., and is from 5,400 to 4,200 feet above sea-level. The mountains on either side are from 9,000 to 10,000 feet high, and consist partly of gneiss and slate, partly of dolomite. The sides are clothed to a height of 1,000 to 1,500 feet with pines and larches; no deciduous trees grow at this level. At the upper end of the valley is a lake a mile long containing excellent trout.

CLIMATIC.

The following factors are concerned:

1. The rarity of the air—mean barometric pressure 632 millimetres.
2. The low temperature, 37° F. being the annual mean, about that of St. Petersburg or Iceland. The ground is covered with snow generally from mid-November to mid-April. Summer nights are cool, rarely above 55° F.

3. The intensity and duration of the solar radiation. The summer sun loses less than half its heat in mid-winter. January has 55 per cent. of the possible sunshine.

4. The dryness of the air, which is hence so bad a conductor of heat as to make even intense cold but little felt. The mean total rain and snowfall is equivalent to $35\frac{1}{2}$ inches of water.

5. The purity of the atmosphere from suspended particles, amounting in winter to a complete absence of dust.

6. The absence of cloud and mist: in an average winter there are 102 fine days, 22 medium, and 58 bad.

7. The absence of wind: from December to March there is generally



DAVOS IN WINTER.

an absolute calm on fine days. Eighty-five per cent. of the wind observations give N.E.—*i.e.*, the south balconies are in sun, but out of the wind.

8. The high content in the air of radio-active substance and of electric potential.

PHYSIOLOGICAL.

At 5,000 feet an increase of some 25 per cent. occurs in the red cells of the blood, with roughly corresponding increase in hæmoglobin. Metabolism is increased, making greater demands on the organs of assimilation and excretion. Chest capacity is increased. Sleep, if shorter, appears to be sounder.

INDICATIONS.

The climate is suitable for all persons who can respond to the increased demand for heat production, assimilation, and excretion, irrespective of the extent of the disease. Hence those with feeble circulation, extensive emphysema or renal disease are unlikely to benefit. Laryngeal irritability may be unfavourably affected by the dry cold. Severe pyrexia is a contra-indication to the journey, not to the climate.

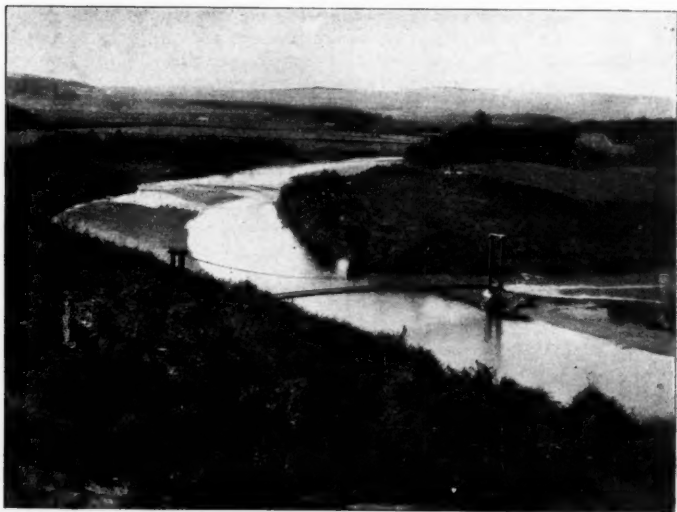
ACCESS, ETC.

Davos is now less than twenty-four hours by rail from London. Winter accommodation is to be found in Platz, Dorf, or Clavadel; at all of these there are sanatoria, as well as hotels, boarding-houses, and villas. The Queen Alexandra Sanatorium, for persons of small means, is in construction, and will take the place of the present Invalids' Home. Disinfection of rooms is compulsory, spitting a punishable offence.¹

EGBERT C. MORLAND, M.B.

¹ In preparing the above sketch I have drawn freely from two sources: "A Handbook of Climatic Treatment," by W. R. Huggard, M.D., Macmillan and Co.; "Davos as a Health Resort," by various Contributors, Davos Printing Co., 1906.

NAIRN, SCOTLAND.



INVALIDS' WALK ALONG BANKS OF RIVER NAIRN.

This northern resort, on the southern shore of the Moray Firth, owes much of its distinction to the late Dr. Grigor. Its chief features have been well summarized by Dr. Brodie Cruickshank, the present Medical Officer of Health.¹ The place undoubtedly offers many advantages for those predisposed to tuberculosis and for those in a quiescent condition requiring the maintenance of open-air life. Its position gives it the benefit of a seaside station. Special baths may be had in a well-conducted establishment. Perhaps the special feature for those called upon to live the strictly hygienic life is the excellent and picturesquely-situated golf links. The porous character of the soil ensures ready drying after rain. The climate is essentially bracing. The rainfall is small, the annual mean being only little over 20 inches. The summers are relatively cool, and the winters not unduly cold. The mean annual temperature is about 46 degrees. During the spring, north and east winds prevail, but during the rest of the year the prevalent winds are southerly and westerly. As a winter resort it merits attention. Little snow falls, hard frost is exceptional, and mist and fog are almost unknown. After a year's careful observation as a health-seeking visitor, I have no hesitation in commending Nairn to the consideration of my confrères.

JOHN SHAW McLAREN, F.R.C.S.E.

¹ "Nairn as a Health Resort." By Brodie Cruickshank, M.A., M.D. Nairn: Nairnshire Telegraph Office. An excellent little descriptive illustrated handbook has been compiled by the authority of the Town Council, and may be had on application. Useful guides to houses and apartments may be obtained from Mr. J. Macintosh and Mr. William Dallas.

REVIEWS AND NOTICES OF BOOKS.

THE EARLY DIAGNOSIS OF TUBERCULOSIS.¹

IN many respects Dr. Morland's translation of the first two sections of Turban's "*Beiträge zur Kenntnis der Lungen-Tuberculose*," published in 1899, is an excellent one, and should be in the hands of every general practitioner, principally for two reasons: Firstly, because it is to the general practitioner we must look for the earliest detection of this insidious disease; and, secondly, because Dr. Turban discusses the early signs and symptoms with a minuteness not to be found in any other work on the subject with which we are acquainted. The book is divided into three sections: In Section I. the significance of the presence or absence of tubercle bacilli in the sputum is discussed, and, after giving the views of various authorities on the subject, the opinion is expressed that "clinically the first stage of tuberculosis of the lung may be demonstrated before the bacilli appear in the sputum." With this opinion we cordially agree. The modern pathology and the origin of pulmonary tuberculosis and the causes of the survival of the theory of duality is well expressed, and the possibility of the tubercle bacillus lying long dormant in the tissues is clearly presented. Section II. is devoted to the classification of pulmonary tuberculosis, and includes the groupings suggested by Brehmer, Königer, and Meissen's modification of Turban's own. We note that Dr. Turban still adheres, with slight alteration, to the three classical stages of pulmonary tuberculosis. We think this is to be regretted as being somewhat misleading, when we take into consideration that all three stages must be more or less present at the same time. Section III. is devoted to the physical examination of the lungs, and this part of the book we think very good. There is one exception, however, we would make, and that is to the description of the use of the Röntgen rays in the early diagnosis of pulmonary tubercle, for here the author is evidently describing the work of others, and is not speaking from his own individual observation. We are disposed to think that Dr. Turban does not lay sufficient stress on the value of these rays in early diagnosis. There is one point, however, in which we are in complete accord with the author, and that is on the diagnosis of tuberculous bronchial glands by this method. We are convinced that the Röntgen rays will show enlarged bronchial glands before any other method of physical examination at our disposal. Dr. E. Morland has performed his task admirably, and we can confidently recommend this book to the perusal of all practitioners who are desirous of diagnosing the disease at its very beginning.

HUGH WALSHAM, M.D.

¹ "The Diagnosis of Tuberculosis of the Lung, with Special Reference to the Early Stages." By Dr. K. Turban, Director of the Sanatorium at Davos. With an Introduction by Sir Dyce Duckworth. Translated by Dr. E. C. Morland. London: Bale, Sons and Danielsson. 1905. Price 5s. net.

ESTABLISHMENTS FOR THE TUBERCULOUS.¹

Dr. Rufenacht Walters has provided our most complete and authoritative guide to sanatoria for sufferers from pulmonary tuberculosis. The fact that this work has already reached a third edition obviates the necessity of detailed review. It is the only comprehensive volume on the subject in the English language, and must be consulted by all who desire accurate and full information either on the principles of the sanatorium treatment of phthisis or on the details of the various sanatoria in different parts of England or of other countries. The first part of the work is general, and deals with the general problems connected with sanatoria, climates, sites, the grounds, construction, decoration, and furniture of sanatoria, institutions for special classes, size of and staff and management of sanatoria. Then follows a particularly helpful section of the first part, which deals with the outlines of sanatorium treatment, fresh-air treatment, rest and exercise, diet, precautions against infection, results of treatment, and answers to objections. The second part gives a full and well-illustrated description of all the important sanatoria in all the civilized parts of the world. It is astonishing what an amount of detailed information has been collected in this part, very largely as the result of personal investigation, and Dr. Walters, being himself a skilled administrator of a sanatorium of the best type, has been able to bring to his descriptions the weight which is given by experience and practical knowledge. We can confidently recommend the book to those desiring authoritative information, either on the principles underlying the hygienic treatment of phthisis, or on the application of these principles in practice.

ARTHUR NEWSHOLME, M.D.

SANATORIA FOR CONSUMPTIVE WORKING MEN.²

This up-to-date contribution to the study of consumption, from the financial and sociological standpoint, contains much valuable information for those working at the tuberculosis problem. It contains tables of foods and dietaries, not estimated, but actually used, and also statistical tables of various kinds, which are original in character and of the greatest practical value. In considering the book as a whole, two things stand out relating to consumptives and their work—in other words, concerning their economic value. First, the absolute importance of abundance of good food; secondly, the fact that hard physical work, even under good circumstances, is usually found impossible for the consumptive with arrested disease. Economically, this is a very important fact. Outdoor occupations are generally spoken of as the desideratum for the consumptive who is well enough to return to work. But it cannot be forgotten that generally he is an unskilled labourer, and the lower branches of gardening and farming

¹ "Sanatoria for Consumptives: A Critical and Detailed Description, together with an Exposition of the Open-Air or Hygienic Treatment of Phthisis." By F. Rufenacht Walters, M.D., M.R.C.P. Third edition. Pp. xvi and 389, with 82 full-page figures. London: Swan Sonnenschein and Co., Ltd. 1905. Price 12s. 6d. net.

² "The Consumptive Working Man: What can Sanatoria do for Him?" By Noel Dean Bardswell, M.D., M.R.C.P., F.R.S. (Edin.), Medical Superintendent, King Edward VII. Sanatorium. Pp. 202. London: The Scientific Press, Ltd. 1906. Price 10s. 6d. net.

are of an arduous physical character. It is only the higher departments of such work that are really suitable for most consumptives, and this requires an expensive training. It is wise to have published a letter from the case of a grocer's assistant who emigrated to New Zealand. He says: "It is a mistake to send any consumptives from England out here unless they have a trade. . . . My advice is, unless one has the best of prospects, to stay at home and get suitable employment there." Medical practitioners need to have statements like this impressed upon them, for the advice to go to the Colonies is very common, and those of us who are working at this subject see the disastrous results which frequently follow emigration. It is unfortunate that only the case of male patients are considered in this monograph; the more difficult puzzle of providing for the female consumptive is left untouched. Dr. Bardswell's work is most instructive and interesting throughout, and should be read by all serious workers.

JANE H. WALKER, M.D.

THE OPEN-AIR TREATMENT OF PULMONARY TUBERCULOSIS.¹

In an unpretentious volume Dr. Burton-Fanning gives a clear and concise account of what is generally spoken of as "the open-air" or "sanatorium" treatment of tuberculosis. The contents of the book are divided into the following chapters: (1) The Etiology of Pulmonary Tuberculosis; (2) The Temperature in Pulmonary Tuberculosis; (3) The Pulse and Respiration; (4) The Selection of Cases for Treatment; (5) Treatment of Febrile Patient; (6) Treatment of the Convalescent Patient; (7) Diet in the Treatment of Pulmonary Tuberculosis; (8) Results of Sanatorium Treatment and Subsequent Care of the Patient; (9) Requisites for the Open-Air Treatment.

In the chapter on Etiology, Dr. Burton-Fanning draws attention to the fact that consumptives among the better classes very rarely infect those with whom they live. It is not, I think, sufficiently recognised that the consumptive, when educated, should not be any sort of danger whatever.

The chapter on Selection of Cases is perhaps the best in the book. In it Dr. Burton-Fanning gives much excellent advice—the opinions of a thoughtful and experienced observer. Most physicians with much experience of consumption will agree with him that "it is generally politic to give the patient the benefit of a true statement of his case, and to avoid buoying up the patient with a false account of his condition." And, further, "that it should be our aim to recognise tuberculosis before obvious physical signs present themselves, and to place the patient immediately under treatment."

The book throughout is of an eminently practical character, and as such will be of particular value to the practitioner and to all those who are commencing sanatorium work. To the experienced sanatorium physician the book will not appeal quite so forcibly, since want of space forbids the writer going deeply into any part of his subject, or dealing with many interesting physiological and pathological problems associated with consumption and its treatment. NOEL D. BARDSWELL, M.D.

¹ "The Open-Air Treatment of Pulmonary Tuberculosis." By F. W. Burton-Fanning, M.D., Visiting-Physician to the Kelling Open-Air Sanatorium, Pp. 176. London. 1905. Price 5s.

CONSUMPTION AND CIVILIZATION.¹

It is safe to say that Dr. Huber's book on "the great white plague" has no rival of its kind in the English language. It is exceedingly complete, demanding the attention alike of the layman and the physician, and will be of the utmost service to every serious student of tuberculosis. Dr. Huber says a few things which excite our surprise, no doubt. He still speaks of scrofula and struma, and describes the types. He accepts without any reserve the doctrine of hereditary transmission of the tendency to the disease, though, as I have pointed out elsewhere, there are no published statistics which exclude the question of relative exposure to infection. He has nothing to say of the work of Wright on opsonins, the comparative study of which in new-born children of tuberculous and non-tuberculous parents should, I think, form the first critical contribution to the question of heredity in its modern form. Also, Dr. Huber approves of moderate quantities of alcohol for the tuberculous. And other like comments might be made. But these are trifles. Notwithstanding them, the book before us is unique of its kind, and we can scarcely imagine it surpassed. It is enriched with numerous and very valuable illustrations, diagrams of sanatoria, statistics in graphic form, and so on. Each section and chapter is headed by a quotation, and if these were separately printed they would themselves be worth the price of the book. The author's own text is exceedingly lucid, spirited, and yet judicial. His knowledge of the subject as a whole is quite evidently peculiar to himself, and he has turned it to the best account. Long may he be spared to bring up to date the successive editions which surely await this really magnificent piece of work.

C. W. SALEEBY, M.D.

THE ORIGIN OF TUBERCULOSIS.²

The extinction of tuberculosis is an ideal which makes us turn to Dr. Pickett Turner's brochure with great expectations. In his preface he states that, so far as he is aware, his is the only attempt that has ever been made to deal with tuberculosis as a whole, to trace its origin to its primary source, and to attempt its complete extirpation in man and animals. This statement does not argue a wide acquaintance with the literature of the subject. In a small book of under 100 pages, more than a third of which is devoted to other affections, Dr. Turner discusses the problem of the origin of tuberculosis and its extirpation. He revives the theory that bovines obtain the disease from Timothy and other allied grasses "by natural affinity," and asserts that man acquires it by ingestion or inoculation, never by inhalation. The key to prevention is thus stated: "The bacillus in a state of nature is a saprophyte, but becomes pathogenic in cattle when they are deprived of actinism. It is reasonable to assume that by restoring actinism to them the bacillus will again become a saprophyte, in which case we shall have completely extirpated the disease."

Those who are desirous of following the line of thought by which

¹ "Consumption: Its Relation to Man and his Civilization." By J. D. Hubert A.M., M.D. Pp. 536, with 131 figs. Philadelphia and London: J. B. Lippincott Co. 1906. Price 15s. net.

² "Tuberculosis: Its Origin and Extinction." By W. Pickett Turner, M.D. Pp. 96. London. 1906. Price 2s. 6d. net.

the author has arrived at these assertions are referred to the book itself. Personally, we are obliged to confess that we have not been able to experience the amount of enthusiasm which the publisher's notice promises to the readers of this book. J. EDWARD SQUIRE, M.D.

TUBERCULOUS BRONCHIAL "EMBOLI."¹

Dr. Sabourin's monograph is a most original and valuable contribution to our knowledge of chronic pulmonary tuberculosis. The special feature of interest is the author's view regarding the true nature of those pneumonic processes, which occur from time to time in the course of chronic phthisis. He regards most of these pleuro-pneumonias, whose site of election is the posterior portions of the lung, adjacent to the interlobar fissure, as being essentially of the nature of infarcts, not of vascular, but of bronchial origin, being limited to the regional area of distribution of some particular bronchus and pedicle of nutrition. As the embolus, which blocks the bronchus, is composed of active tuberculous material derived from some pre-existing lesion, there is a marked tendency for these pneumonias, which are invariably secondary manifestations, to undergo a process of necrosis leading to excavation. They play, indeed, precisely the same part in chronic phthisis that caseous broncho-pneumonias do in acute phthisis. The author's views are based on careful clinical observations, lucidly recorded and illustrated. He claims that a knowledge of these processes is of the utmost practical value. He indicates how these complications, which so greatly modify the course of an individual case, may be avoided, and makes the interesting observation that these pneumonias, which are often vaguely spoken of as congestive or influenzal attacks, generally occur after fatigue, and are rarely met with among patients undergoing a rest cure in a sanatorium. R. MURRAY LESLIE, M.D.

THE HOME TREATMENT OF CONSUMPTION.²

Large numbers of consumptives have, of necessity, to be treated in their own homes. In the management of such Dr. Crowe's excellent little book should be of real service. It contains directions for rules and explanations thoroughly practical and yet simply worded, and for the most part are, indeed, those insisted upon in a good sanatorium. There are, however, one or two points which should be attended to in a future edition. On page 14 we are told that "the door of the room must be shut," and this is emphasized by italics. It would be far safer to say that in most places "the door of the room must never be shut unless a strong wind is blowing." There are many days when the air of a room (even if provided with a bow window) would stagnate without large openings on opposite sides; and the knowledge of this fact has determined the plan of all the best sanatoria. On page 21 it is stated that all exercise is to consist of slow walking on the level. This is absolutely opposed to the practice of the best sanatoria, where after a time graduated hill-climbing is regarded as of the utmost

¹ "Les Embolies Bronchiques Tuberculeuses." Par Dr. Ch. Sabourin, Directeur de Sanatorium de Durtol. Pp. 264. Paris: Felix Alcan. 1906. Prix 4 francs.

² "Consumption: Treatment at Home, and Rules for Living." By H. Warren Crowe, M.D. Pp. 32, with charts. Bristol: John Wright and Co. 1906. Price 1s. net

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importance. In other respects the book may be warmly recommended, and should prove a welcome help to the overworked practitioner.

F. RUFENACHT WALTERS, M.D.

THE NURSING OF CONSUMPTIVES.¹

Dr. Jane Walker's little handbook is admirably practical and simple, and embodies an experience of many years' close application to detail on the part of the writer. The nursing arrangements of a sanatorium present many difficulties, because personal rather than professional qualities are demanded. This is recognised in this manual; but we think even more might be said as to the nurse's rôle in supporting her patients mentally and morally through the long, monotonous months of "curing." The nurse must skilfully hold for the patient that delicate balance between doing too much, with consequent physical harm, and doing too little, with consequent moral stagnation. In dealing with hæmorrhage, we miss a reference to the need for calm on the nurse's part. "The patient must be kept absolutely quiet"—yes; but this is only accomplished by the exercise of much strong personal influence. Fussiness, irritating cheerfulness, and alarm, are all equally to be avoided. The importance of pulse observation deserves rather more notice, and no mention is made of the possibility of sterilizing sputum by boiling. But no nurse could read this book and still feel that the nursing of consumptives had "nothing in it."

ESTHER L. CARLING, M.D.

SANATORIA IN THE UNITED STATES AND CANADA.²

A French critic said that the American people care only for money, are indifferent to art, and are now setting out on a career of conquest. Whether the first allegations are true or not, judging from the number of sanatoria and establishments for the treatment of phthisis mentioned in this book, the Americans seem to have embarked in earnest upon the conquest of tuberculosis.

The directory is a useful book, containing information about all the sanatoria of the United States and Canada. It is well got up, and gives photographs of most of the buildings described in the text.

L. M. CHESNEY, M.B.

THE WORK OF THE HENRY PHIPPS INSTITUTE.³

The Second Annual Report of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis is a monument of laborious and careful research and clinical observation.

It is the record of some 1,561 cases which have been treated at the institute from February, 1904, to February, 1905. At the end of this

¹ "The Modern Nursing of Consumption." By Jane H. Walker, M.D., Medical Superintendent of the East Anglian Sanatorium. Pp. 47. London: The Scientific Press, Ltd. 1904. Price 1s. net.

² "A Directory of Institutions and Societies dealing with Tuberculosis in the United States and Canada." Compiled by Lilian Brandt. Pp. 263. Illustrated. New York: Charity Organization Society and National Association for the Study and Prevention of Tuberculosis. 1904.

³ Second Annual Report of the Henry Phipps Institute. Pp. 452. Philadelphia: Henry Phipps Institute. 1906.

bulky volume copies of the case papers and forms used in the institute are given, and one has only to look at these in order to realize how painstaking and exacting are the investigations made for the purpose of giving, to use Dr. Flick's own words, "a broad, practical view of the tuberculosis problem."

The manner in which these investigations are being carried out is deserving of great admiration, for in many respects the conditions under which the institute works are apparently far from favourable.

The statistics resulting from the laborious work of the energetic staff have been summarized in a very clear manner, but though very numerous, do not appear to throw much new light upon the difficulties of the tuberculosis problem.

The report on the cases treated with Maragliano's serum and the comparison of these with other cases treated without serum is interesting, but the investigations are not sufficiently extensive to be of much value in determining the value of this method of treatment. Dr. Ravenel's report, after spending six weeks in Professor Maragliano's laboratory and clinic, is exceedingly interesting.

Dr. Carncross contributes a suggestive paper on the "Mental Attitude in Tuberculosis," and goes far to show that tuberculosis exerts no specific change upon the mental state. Those who have charge of consumptive patients should note the opinion that—

"There are distinctly morbid psychological states amongst these patients, the commonest of which appears to be a state in which the patient is morose, very irritable, quick to suspect, ready to find fault, perverse, antagonistic, and though open to suggestion temporarily if tactfully managed, very difficult to control in the long run."

The staff of the Henry Phipps Institute are to be heartily congratulated upon this worthy record of scientifically conducted work. Much useful information is to be found in these accumulated reports, but perhaps the most important result of their labours is to be found in the splendid educational work which they are carrying on amongst the poor in the heart of Philadelphia.

W. G. KINTON, M.B.

THE PRINCIPLES OF CLIMATOLOGY.¹

Dr. Huggard in his new work seeks to place the therapeutics of climate on a secure foundation, and to enable the physician readily to understand the principles of choice in the selection of health resorts, baths, and mineral waters. The book is evidently the outcome of many years of practical experience, and the author shows at all points that he is a thorough master of his subject. Beginning with meteorology, a concise and clear account is given of the atmosphere and its various constituents. The subjects of temperature, humidity, barometric pressure, and electricity, and their effects upon climate, are fully discussed. The second part of the volume deals with the physiology of climate, and the influence which various kinds of climate have upon metabolism. The different types of climate are fully described, and an original and interesting system of classification is adopted. Details of the climates of a large number of health resorts in

¹ "A Handbook of Climatic Treatment, including Balneology." By William R. Huggard, M.A., M.D., F.R.C.P. Lond. Pp. 519. London: Macmillan and Co. 1906. Price 12s. 6d. net.

Europe, America, and elsewhere are given. Many considerations must be taken into account before deciding what health resort is most suitable for a given patient. "The tendency in our days," says Dr. Huggard, "is, unfortunately, to send all patients whose ailment bears the label of consumption to one resort, or to one type of resort. At one moment fashion favours high altitudes; at the next moment she sends patients in flocks, perhaps, for a sea-voyage, perhaps to a damp and, it may be, windy sanatorium. But this indiscriminate practice is radically unsound, and leads in many cases to disastrous results, which a small amount of reflection on the principles involved would suffice to avert." The various kinds of baths and mineral waters and their uses are dealt with at some length. The concluding chapters are devoted to various diseases, and the principles upon which the choice of the most suitable climatic treatment of them should be based. It is not too much to say that this admirable book should be in the hands of every medical man, be he physician or surgeon, who desires to understand the principles that should guide him in the climatic or balneological treatment of disease.

JAMES BERRY, F.R.C.S.

THE STUDY OF A COMMON COLD.¹

The subject of this work is the ordinary "cold," or coryza, and a considerable part of it is taken up in proving the infective character of this ailment. If there be anyone who does not believe in the infectivity of this form of catarrh, he would do well to closely study these pages and be converted.

The bacterial causation of the disease is well and fully discussed, and some good experimental work done by Dr. White is carefully described. Beyond the fact that Cautley's *Bacillus coryza segmentosus* is found to be present during the first few days in almost every case, no definite conclusion is arrived at.

The danger of conveying infection to aged and delicate persons and those who are the subject of tuberculosis is rightly laid stress upon.

No one, probably, will be inclined to dispute the fact that catarrh predisposes to tuberculosis; but the author somewhat exaggerates the effect of an ordinary coryza in setting up the apical catarrhal condition of the lungs found in early phthisis.

The book is interesting and full of valuable suggestions.

GEORGE JOHNSTON, M.D.

THE NOSE AND ITS ACCESSORY SINUSES.²

The nose and its accessories can no longer claim to be *terra incognita*. Among the many recent works dealing with the nasal cavities Dr. Lambert Lack's handsome volume must be accorded a prominent place. It has grown out of his well-known Jacksonian Prize Essay on "The Pathology, Diagnosis, and Treatment of the Inflammatory Affections of the Nose and its Accessory Sinuses and Air Cells," and now forms a systematic yet concise and excellently illustrated manual

¹ "Catarrhal Fevers, commonly called Colds." By R. Prosser White, M.D., M.R.C.S. Pp. viii, 111. 1906. Price 3s. 6d.

² "The Diseases of the Nose and its Accessory Sinuses." By H. Lambert Lack, M.D., F.R.C.S. Pp. 399, with 124 illustrations. London: Longmans, Green and Co. 1906.

for practitioners and senior students, in which, while diagnosis receives its due prominence, the all-important matter of indications for and methods of treatment are by no means relegated to the background. A short section is devoted to tuberculosis and lupus of the nose, and a brief bibliography is given. Special praise is due for the chapter on nasal surgery, which has been dealt with in a masterly fashion. The work has been well planned and carried out with painstaking thoroughness, and should find much favour with those for whom it was written. A very commendable feature is the excellent index compiled by Mr. Archibald Clarke.

PERCY JAKINS, M.D.

ADENOIDS.¹

The operation for removal of adenoid growths has been much improved in technique of recent years, and Mr. Garry Simpson's brochure¹ has been written in order to provide practitioners who have not had the opportunity of seeing the modern operation performed with a reliable guide. The author wisely recommends the lateral position and a curette designed to retain the growth; but we do not think it is necessary to excise the left tonsil from the left side and then to turn the patient over to remove the adenoids and the other tonsil. The removal of tags on the following day is alluded to, but the advantages of an anaesthesia which allows of their removal at the operation are not discussed. The manual is of a thoroughly practical nature in spite of a little unnecessary padding, such as two illustrations of ethyl chloride inhalers and two pictures of glass tubes containing this anaesthetic.

HAROLD BARWELL, F.R.C.S.

DE SENECTUTE.²

Sir Hermann Weber's charming monograph records the experience of a man who, having reached a considerable age, is in a position to declare to us everything that he has observed which is conducive to the preservation of health. He has brought to bear upon the subject great perceptive powers, much knowledge, and a judgment quite unaffected by any bias, prejudice, or theory of his own. It is a plain unvarnished tale, and therefore of the greatest value to young professional men, not only for their own guidance, but useful for the benefit of others. The book, indeed, may be read with advantage by everyone, being devoid of all technicalities. Those persons who have been in the habit of studying their digestion and discussing the most correct foods to eat may with great advantage allow this book to supersede all others of the kind, and especially books which are written to advocate the value of some particular article of food or perhaps medicine.

The reader may gain much by an attentive perusal of the chapter on air and exercise; and for its performance nothing is better than walking. As regards air, he speaks of the value of occasional systematic

¹ "Adenoid Growths of the Naso-pharynx: Diagnosis, Symptoms, and Treatment." By G. A. Garry Simpson, M.R.C.S. Pp. 49. Second edition. London: John Bale, Sons, and Danielsson. 1906. Price 3s. 6d. net.

² "On Means for the Prolongation of Life." Second and enlarged edition. By Sir Hermann Weber, M.D., F.R.C.P. Pp. 104. London: John Bale, Sons, and Danielsson, Ltd. 1906.

breathing, and in proof the writer of this notice can bear witness. When in practice in London he often found, after two hours in his consulting-room, a great feeling of oppression. He would open the window wide and then make a few deep inspirations, the stimulating and reviving effect of which in a few minutes was most remarkable. What the author says of sleep and repose is perhaps the most original part of the work, for he by no means assents to the almost universal opinion, largely supported even by the profession, that people cannot get too much sleep; and if, indeed, they did sleep more than was necessary, no harm would come of it.

Then, in addition to the ordinary rules for the preservation of bodily health, the author insists that it is necessary that we should take an interest in many things to prevent mental torpor. We should cultivate cheerfulness, and as life advances we should make an effort or a strong determination not to decay too early. Our object to preserve all the organs and tissues of the body in their integrity is accomplished by continually using them. I may say in conclusion that this is a most admirable book and eminently practical.

SIR SAMUEL WILKS, M.D.

THE PROBLEM OF IMMUNITY.¹

Professor Ehrlich's work consists of a collection of forty-one studies on immunity, published from the year 1899 onwards by himself and his pupils. The volume is not only important in explaining the mechanism of immunity, but as shedding light on the intimate processes of cell nutrition. No doubt there is a disinclination in many of us to master the technicalities of new modes of inquiry, and to remain in a state of smug satisfaction with the earlier teachings of our student days; and it must be confessed that such terms as "amboceptors," "anticomplements," "heterolysins," and the like, are sufficiently alarming to the novice. Nevertheless, not to master the teachings of this brilliant investigator is to remain hopelessly behind in the rapid—we had almost said forced—march of biological science. To us Ehrlich's work has opened up a veritable fairy-land of science, and we would strongly counsel all those who desire to master his teachings to learn them first-hand from these studies, rather than from the text-books and journals. Each individual communication bears evidence of careful preparation, and the translation and the printing are alike admirable.

HARRY CAMPBELL, M.D.

THE PRACTITIONER'S HANDBOOK ON PULMONARY TUBERCULOSIS.²

For the busy practitioner desirous of obtaining sound direction regarding the early diagnosis of consumption and reliable data for the formation of a helpful prognosis, Dr. Hyslop Thomson's work is to be thoroughly recommended. It is based on an extensive practical

¹ "Collected Studies on Immunity." By Professor Paul Ehrlich. Translated by Dr. Charles Bolduan. Pp. 586. London: Chapman and Hall, Limited. 1906.

² "Pulmonary Phthisis: its Diagnosis, Prognosis, and Treatment." By H. Hyslop Thomson, M.D., Visiting Physician to the Consumptive Sanatorium of Scotland, Bridge of Weir, N.B. Pp. 188. London: John Bale, Sons, and Danielsson, Ltd. 1906. Price 5s. net.

acquaintance with sanatorium methods, and is throughout eminently sane in its presentation and rational in its teaching. The most valuable portion of the book is that which deals with tuberculosis in children. Some inexperienced writers have contended that pulmonary tuberculosis in childhood is relatively rare, and not tractable to treatment. We are glad to see that Dr. Thomson satisfactorily disposes of such erroneous views. He quotes Dr. A. Greenwood's recent returns, showing that out of 338 school-children, 54 were suffering from tuberculous disease, 34 with involvement of the lungs. Sir William Broadbent has shown that no fewer than 6,391 children under the age of five years died in London from tuberculous disease during the years 1901-1903. Pulmonary tuberculosis was stated to have been the cause of death in 471 infants under the age of two years, but after that age it was, apart from tuberculous meningitis, the most fatal form of the disease. In Glasgow, we are told, tuberculosis of the lungs is a very prevalent disease in childhood. It is astonishing that the tuberculous child should have been so neglected in this country. It is estimated that, while France provides between 5,000 and 6,000 beds for the rational treatment of tuberculous disease in children, England has not 500. While we have been building elaborate and expensive sanatoria for the adult, the needs of the children have been forgotten or neglected. Dr. Hyslop Thomson has done well to draw attention to the urgent need for open-air sanatoria for consumptive children, and prophylactic homes to which children could be sent who, though not actively tuberculous, are predisposed to the disease.

If we are to accept the teaching of Behring that pulmonary tuberculosis in the adult is frequently caused by auto-infection from a pre-existing tuberculous focus in the lymph glands or other structures, and if we admit the author's contention that pulmonary tuberculosis is "more amenable to open-air treatment between the ages of four and twelve than at any other period of life," then we may readily agree with his practical deduction that the provision of sanatoria and suitable "prophylactic homes would not only diminish the death-rate from tuberculosis amongst the young, but would materially influence the prevalence of pulmonary manifestations of tubercle in adult life." Dr. Hyslop Thomson's handbook is a welcome addition to the rapidly growing literature on the rational study and reasonable treatment of consumption.

PRACTICAL STUDIES IN PULMONARY DISEASE.¹

In these days of laboratory research and experimental inquiry there is a danger of neglecting the art of the physician. Dr. Lindsay's most systematic and attractive clinical lectures will do much to meet the needs of practitioners desirous of having in concise and convenient form reliable guidance in solving the problems of pulmonary disease as met with in actual practice. The work deals essentially with questions of practical diagnosis and treatment. The 166 pages devoted to tuberculosis of the lungs form quite a monograph, and in well-arranged sections afford the practitioner just the knowledge and direction he

¹ "Lectures on Diseases of the Lungs." By James Alexander Lindsay, M.A., M.D., F.R.C.P. Second Edition. Pp. 510. London: Baillière, Tindall and Cox. 1906. Price 10s. 6d. net.

requires to fulfil his responsible duties of medical adviser. The importance of early recognition of the disease is wisely insisted on, and full indications are given as to how this may be best attained. The difficult question of prognosis is approached with a discernment and caution born of long experience of the vagaries and infinite varieties of the disease. The directions for treatment will be of particular value to the much-harassed practitioners. Dr. Lindsay is to be congratulated on his second edition, which is, indeed, in great measure a new work.

X RAYS AND THE DIAGNOSIS OF AFFECTIONS OF THE CHEST.

The Röntgen rays have brought new powers to the diagnostician in dealing with intrathoracic disease. Drs. Hugh Walsham and G. Harrison Orton, in their opportune work,¹ have furnished the practitioner with just the concise and practical summary of the advantages and limitations of this still imperfectly understood and exceptionally used power which they so much needed. It is shown that by means of the X rays considerable help may be afforded in the recognition of pulmonary tuberculosis. The following are mentioned as occurring in many of these cases:

1. The movement of the shadow of the diaphragm is restricted on the affected side or sides, usually in the lower part of its excursion.
2. One or both apices fail to light up on deep inspiration.
3. The diseased portion of the lung casts a dark shadow.
4. The heart, in a large majority of cases, is smaller than normal, and placed more vertically in the chest. In more advanced cases displacement of the heart can often be made out better by means of the rays than by percussion.
5. Alteration in the shape of the chest and position of the ribs can, in many cases, be determined more easily by means of the rays than by any other method at our disposal.

The work, with its excellent reproductions of skiagrams, is one which should be studied carefully by every physician called upon to deal with chest cases.

STUDIES IN CARDIO-VASCULAR DISEASE.

The student of pulmonary disease is in danger of restriction of clinical vision. The physics and pathology of the chest require to be studied as a whole, and those who would gain insight into the perplexities of morbid processes involving the lungs cannot afford to neglect the investigation of cardio-vascular conditions. Among recent works on the heart and vessels there are three which demand particular attention.

Dr. James Mackenzie's masterly monograph² is epoch-making, for it not only puts old facts in a fresh light, but, by ingenious and thoroughly practical new methods of clinical research, places invaluable

¹ "The Röntgen Rays in the Diagnosis of Diseases of the Chest." By Hugh Walsham, M.A., M.D., and G. Harrison Orton, M.A., M.D. Pp. 80, with 18 plates and 22 illustrations. London: H. K. Lewis. 1906. Price 6s. net.

² "The Study of the Pulse, Arterial, Venous, and Hepatic, and of the Movements of the Heart." By James Mackenzie, M.D. Pp. 325. Burnley: Lupton Bros. Price 18s.

means at the disposal of the physiologist and physician, which have already gone far to revolutionize much of current teaching in regard to cardiac action both in health and disease. The section devoted to the venous pulse is of the utmost importance. The whole subject is, of course, intricate and abstruse, but the author's lucid exposition, supplemented by an excellent series of carefully selected figures, renders the whole work peculiarly attractive. No clinician can afford to disregard this life-work of an eminent general practitioner.

Sir William Broadbent's manual¹ is so well known and prized that a review is merely an act of supererogation. It forms an almost ideal clinical handbook for the busy practitioner. The latest and fourth edition has been prepared by Dr. John F. H. Broadbent. Much of the subject-matter has been rearranged, new chapters have been added on the pulse, disease of the coronary arteries, bradycardia, and aortic atheroma, and the sections on malignant endocarditis and affections of the myocardium have undergone considerable change. The author has, however, carefully revised the whole of the proofs, so that the work still stands as a clear clinical portrayal of cardio-vascular disease by one who is a recognised master of the subject.

Dr. Graham Steell's new volume² is a clinical handbook for students and practitioners. It presents pictures drawn "from life," and the stultifying influence of "authority" has been excluded as much as possible. The work is the presentation of the mature views of one who has devoted a lifetime to the observation of the cardiac patient, and who has spared no pains to discover the principles which should govern the management of these cases. Throughout there is the ring of an honest individual expression of opinion, and the record of valuable personal observations are presented with a self-suppression and restraint born of a truly scientific spirit. To Dr. Steell's many old students this book will be most welcome, and practitioners generally will find in it an invaluable guide to the clinical study and rational treatment of heart disease.

THE DIETARY OF THE TUBERCULOUS.

Dr. Francis Hare's interesting studies³ into the humoral factor of disease are of considerable interest to the investigator of tuberculosis, providing, as they do, many suggestive speculations as to the predisposition to consumption, and emphasizes the existence of the important personal factor, which the author considers "to have slipped into the background of late rather more than is expedient."

The remarkable treatise of the Hon. R. Russell⁴ in regard to food

¹ "Heart Disease and Aneurysm of the Aorta, with Special Reference to Prognosis and Treatment." By Sir William Broadbent, Bart., K.C.V.O., M.D., F.R.S., D.Sc., LL.D., F.R.C.P., and John F. H. Broadbent, M.A., M.D., F.R.C.P. Pp. 479. Fourth edition. London: Baillière, Tindall and Cox. 1906. Price 12s. 6d. net.

² "Text-Book on Diseases of the Heart." By Graham Steell, M.D., F.R.C.P., Senior Physician to the Manchester Royal Infirmary. With an Appendix on "The Volume of Blood in Relation to Heart Disease," by J. Lorrain Smith, M.A., M.D. Pp. 389. Manchester: Sherratt and Hughes. 1906. Price 7s. 6d. net.

³ "The Food Factor in Disease." By Francis Hare, M.D. In two volumes. London: Longmans, Green and Co. 1905. Price 30s. net.

⁴ "Strength and Diet: A Practical Treatise with regard to the Life of Nations." By the Hon. R. Russell. Pp. 649. London: Longmans, Green and Co. 1905. Price 12s. 6d.

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and racial characteristics, with its wealth of references and interesting speculations and practical suggestions, is one which medical men dealing with the nutritional problems of tuberculosis might consult with advantage.

The housekeeper of the sanatorium will welcome M. E. Seurre's little volume,¹ containing references to over 2,500 dishes. It is a concise *aide mémoire* on high-class modern cuisine.

THE PRESERVATION OF FOOD.²

In these days of urbanization and peregrination man can no longer follow the simple dietetic life of the savage, but requires an elaborate machinery for the preparation, collection, and preservation of his food. And with the coming of complexity arrive manifold risks. The dangers incident to the use of preservatives and colouring matters in the preservation and colouring of food has been the subject of an important Departmental Committee of Inquiry. Drs. Thresh and Porter have now collected and connoted in a masterly manner all reliable information bearing on this important matter, and have also dealt with the closely related question of unsound food. This is a work which no student of the tuberculosis problem can afford to neglect. The whole subject of the purity of milk and dairy produce is most thoroughly dealt with, and the question of the propagation of tuberculosis by these means is ably discussed. The work is of great interest to both scientist and layman; and to the sanitarian and those responsible for the conduct of sanatoria, hospitals, schools, and other institutions, it must prove invaluable.

MANUALS FOR STUDENTS AND RESEARCH WORKERS.

Sir A. E. Wright, by his brilliant scientific explorations, has opened new lands for investigators and revealed fresh therapeutic fields for the practitioner, and in his latest production³ he has provided the microscopist with a unique work, which in its originality and suggestiveness will have far-reaching influence on the technique of the microscope. The work is elaborate, and deals with abstruse problems. It is divided into two sections, treating respectively of the development of the object or stage-picture and the magnified microscopic image. In the evolution of microscopy this work will be epoch-making.

The Johns Hopkins Hospital has won world-wide distinction for the thoroughness of its scientific teaching, and in Dr. C. P. Emerson's elaborate work⁴ on clinical diagnosis we have, as Professor Osler

¹ "Mulum in Parvo: The New Pocket Cookery Dictionary. Compiled by E. Seurre. Pp. 170. London: Horace Cox. 1906. Price 2s. 6d. net.

² "Preservatives in Food and Food Examination." By John C. Thresh, M.D., D.Sc., F.I.C., and Arthur E. Porter, M.D., M.A. Pp. 484. London: J. and A. Churchill. 1906.

³ "Principles of Microscopy, being a Handbook to the Microscope." By Sir A. E. Wright, M.D., F.R.S., D.Sc., F.R.C.S.I. Pp. 250, with 18 plates and special diffraction grating. London: Archibald Constable and Co., Limited. 1906. Price 21s. net.

⁴ "Clinical Diagnosis: A Text-Book of Clinical Microscopy and Clinical Chemistry for Medical Students, Laboratory Workers, and Practitioners of Medicine." By Charles Phillips Emerson, A.B., M.D., Resident Physician, The Johns Hopkins Hospital. Pp. 641, with 5 plates and 126 figures. Philadelphia and London: J. B. Lippincott Company. 1906. Price 21s. net.

indicates in a luminous introduction, "the experience of the medical clinic of this hospital so far as it relates to microscopical and chemical methods of diagnosis." The author has wisely approached his subject from the wide clinical rather than the limited laboratory point of view. The student of pulmonary disease will find here a comprehensive and trustworthy monograph, of over sixty pages, on sputum. The work throughout is excellent both in its conception and execution, and is, moreover, well illustrated.

Sir Lauder Brunton's many friends and old students, will be grateful to him for having collected his numerous papers—there are no less than thirty-eight in the volume—dealing with researches into the problems of circulation and respiration.¹ Several are the outcome of elaborate investigations undertaken in conjunction with well-known observers. Papers likely to be of particular interest to our readers are those treating of the action and uses of certain remedies employed in bronchitis and phthisis and the pathology of night-sweating in consumption, and its treatment by strychnia and other remedies. Such a volume as this is a worthy record of scientific industry of which any man may well be proud.

Drs. E. H. Colbeck and Arnold Chaplin, in their useful and thoroughly reliable little pocket volume on Prescribing,² have supplied a real want. It contains well-selected examples of various generally approved prescriptions which experience has established as useful aids in the management of phthisis. The work is one which will be very helpful to the senior student and young practitioner.

Dr. Harrington Sainsbury has furnished the thoughtful student and discriminating practitioner with a remarkable study³ of physiological and pathological balance, and the principles which should guide the rational therapist in his application of reliable remedies. In the limits of a short notice it is impossible to indicate the wide philosophical conception and sound exposition of the author. As is well expressed, "details without guiding principles yield but a busy foolishness." Here are admirably laid down in terse and often epigrammatic form the fundamentals which should guide, not only to a right perception of the science of medicine, but to a discreet and helpful conduct of the craft of healing. Such a work as this should be in the hands and mind of every practitioner, and we commend it particularly to those who are entering on the responsibilities of practice.

In the "Practitioner's Handbooks" Series, edited by Harry Roberts, Dr. J. Odery Symes⁴ has concisely summarized our present knowledge of the so-called "rheumatic diseases" in a thoroughly practical manner, which should meet with the approval of the busy doctor. It does not profess to be in any way an original work, but since methods of treatment receive attention it is likely to prove of con-

¹ "Collected Papers on Circulation and Respiration." First series, chiefly containing Laboratory Researches. By Sir Lauder Brunton, M.D., D.Sc., LL.D., F.R.S., F.R.C.P. Pp. 696. London: Macmillan and Co., Limited. 1906. Price 7s. 6d. net.

² "The Science and Art of Prescribing." By E. H. Colbeck, B.A., M.D., F.R.C.P., D.P.H., and Arnold Chaplin, B.A., M.D., F.R.C.P. Pp. 198. London: Henry Kimpton. 1906. Price 3s. 6d. net.

³ "Principia Therapeutica." By Harrington Sainsbury, M.D., F.R.C.P. Pp. 244. London: Methuen and Co. 1906. Price 7s. 6d. net.

⁴ "The Rheumatic Diseases." By J. Odery Symes, M.D., D.P.H., M.R.C.S., L.R.C.P. Pp. 233. London: John Lane. 1905. Price 5s. net.

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THE OPEN-AIR LIFE.

Many think and talk as though "open-air treatment" was a new discovery. All such should read Mr. E. V. Lucas's charming anthology,¹ which is truly "a garland of good or enkindling poetry and prose fitted to urge folk into the open air, and, once there, to keep them glad they came." This little book should be the companion of every open-air patient.

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The "Highways and Byways" Series of guide-books are eminently suited for the easy-going health Rambler and slow-moving, country-loving pedestrian. One of the latest of these charmingly illustrated volumes will be particularly welcome to all medical readers. We refer to Sir Frederick Treves's most admirable delineation of his native county, Dorset,⁵ "a land of moods and changes that knows no monotony, and is indeed so full of hills and dales that there is scarcely a level road within its confines, save by the banks of streams."

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NATURE STUDY FOR THE TUBERCULOUS.

In the evolution of the mind and body of the growing child Nature study is now receiving a recognised place. We need to realize more

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⁵ "Highways and Byways in Dorset." By Sir Frederick Treves, Bart., G.C.V.O., C.B., LL.D. With Illustrations by Joseph Pennell. Pp. 376. London: Macmillan and Co. 1906. Price 6s.

⁶ "Short Holidays in Small Open Boats." By W. H. Macpherson. Pp. 74. London: Horace Cox. 1906. Price 1s. 6d.

clearly that in the management of the invalid, and particularly the consumptive and those called upon to lead the open-air life, Nature can provide both amusement and instruction in endless variety. Of recent years there has been no lack in revealers of the delights of the country. Mr. Charles Stonham has favoured us with the first part of what promises to be a monumental work on British Ornithology.¹ The present number contains sixteen beautifully executed plates in black and white. The text is a model of precision, and affords just that accurate and comprehensive presentation desired by the simple lover of our country's birds. This charming work will be welcomed by all Nature students, and we specially commend it to the notice of the invalid.

For the lover of flowering plants Mr. W. F. Kirby's new work will unfold a new world of delicate charms. It contains 120 coloured plates and short descriptive accounts such as the country rambler requires. It is a work which should have a place in the library of every sanatorium.²

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"The World Beautiful"⁵ is a delicate and dainty work with a wealth of mystical reflection and poetic inspiration stimulating to high enterprise, and the revealing of those purposes and powers which make for fullness of life.

NATURE'S SANATORIA.

DARTMOOR is one of Britain's natural sanatoria. It is a wild, wondrous region, rich in charms for the naturalist, the sportsman, and the rambler, but full of the virtues sought by the physically jaded and mentally tired. Many tuberculous cases do excellently in this district. As a guide to this moorland district, the delights and benefits of which are all so little known to English physicians and health-seekers, we strongly commend the new edition of "Dartmoor and its Surroundings,"⁶ published by the Homeland Association, a body which is doing

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⁴ "The Science of Common Life." By John B. Coppock, B.Sc., F.I.C., F.C.S. Pp. 273. With seventy-six Illustrations. London: Swan Sonnenschein and Co.; Ltd. 1906.

⁵ "The World Beautiful." By Lilian Whiting. Seventeenth edition. Pp. 190. London: Gay and Bird. 1905. Price 3s. 6d.

⁶ "Dartmoor and its Surroundings." By Beatrix F. Cresswell. Edited and revised by William Crossing. Fourth edition. Pp. 129, with illustrations. London: The Homeland Association, Ltd., 24, Bride Lane, Fleet Street, E.C. 1905-1906. Price 1s. net.

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invaluable work in revealing to Englishmen the beauties and resources of their own land.

Among Alpine resorts DAVOS has long held the premier position. An interesting handbook¹ to this cosmopolitan haven of the tuberculous has recently appeared, the introduction to which has been contributed by Dr. W. R. Huggard. The German edition was addressed to "Aerzte und Laien" (to physicians and laymen); and this English version, containing contributions from both medical and lay writers, may well be studied by practitioners, patients, and those who are wise to avail themselves of the prophylactic virtues of wisely selected and judiciously directed travel. The volume, which is delightfully illustrated with chromotype reproductions of water-colour drawings, contains articles on the "Physiology of the Davos Climate," "Treatment of Phthisis in the High Mountains," and "The Fear of Infection at Davos." Dr. K. Turban furnishes "Practical Hints for Doctors sending Patients to Davos," and Dr. A. F. Bill writes on "Sport and Phthisis." The work is one which should be read by all practitioners and others desirous of forming an opinion as to the real value of Davos as a health resort, and particularly as a station for the restoration of the tuberculous.

TRAVEL FOR THE TUBERCULOUS.

The rational study of travel as a prophylactic for those predisposed by inborn tendencies or acquired characters to tuberculosis has in the past been much neglected. For many, and particularly for those who have to be dealt with as invalids, much more has to be allowed for than mere climatology. It is necessary to consider human conveniences and comforts and difficulties and dangers of locomotion, as well as the financial and social aspects of travel. As a useful and reliable guide to both home and foreign resorts, we commend the admirable "Book of Travel"² compiled by the travel editor of the *Queen*. It is a résumé of the practical information which has appeared in that journal from 1894 to 1906.

Medical practitioners having to give advice regarding sea voyages often feel the need of a convenient reference-book, where data respecting our various steamship lines and particulars of arrangements for passengers may be easily found. They will find all they require in the new issue of *Rhodes's Steamship Guide*.³

Mr. C. A. Barnicoat has prepared an alphabetically arranged guide-book,⁴ with chief health and holiday resorts of France, which will supply English and American visitors with a reliable and ready reference-book.

¹ "Davos as a Health Resort" A handbook containing contributions by A. F. Bill, M.D.; A. Brecke, M.D.; the Very Rev. Dean J. Hauri, D.D.; F. Jessen, M.D.; W. G. Lockett; P. K. Mühle, Dr. Phil.; E. Nienhaus, M.D.; H. Philippi, M.D.; W. Schibler, M.D.; Hofrat K. Turban, M.D.; H. J. A. van Voornveld, M.D., and an introduction by W. R. Huggard, M.A., M.D., F.R.C.P., H.B.M. Consul at Davos. Pp. 316. Davos Printing Company, Ltd. 1906.

² "The *Queen* Newspaper Book of Travel." Pp. 504. With 16 Maps and 45 Illustrations. London: Horace Cox. 1906. Price 2s. 6d.

³ *Rhodes's Steamship Guide for 1906-1907*. Edited by Thomas Rhodes. London: George Philip and Son, Ltd. Price 1s.

⁴ "Where's Where: A New Guide for Tourists and Travellers." Compiled and Edited by C. A. Barnicoat. Part I.: France. Pp. 104. With Map. London: Review of Reviews Office. 1905. Price 2s. 6d. net.

It is often necessary to arrange for an arrested phthisical case to go to one of our colonies, and medical men and others desirous of obtaining reliable information respecting the various fields for work or pleasure in our far-reaching Empire should consult the excellent manual prepared by Messrs. W. H. Mercer and A. J. Harding.¹

Medical and other visitors to Berlin will be glad to know that an English edition of Grieben's famous guide-book is now available.²

Travellers, whether for health or pleasure, should not be ignorant of Mr. Forbes's new work,³ which affords in most attractive form much useful knowledge regarding the contemporary history of our Continental neighbours.

Mountaineers will welcome a waistcoat-pocket note-book⁴ containing packing, expedition, and hut and camp lists, and directions respecting the Alpine distress signals.

PURSUIITS AND PASTIMES FOR THE TUBERCULOUS.

In the hygienic treatment of consumption and certain other forms of tuberculosis the importance of regulated bodily exercise has been much insisted on. It has too often been forgotten in actual practice that recreation for the mind is equally, if not even more, important. In seeking to avoid the hindering action of excitement, patients have often been allowed to sink into a stultifying somnolence of thought and demoralizing selfishness of action. To steer a clear course in these matters requires tireless patience and inexhaustible enthusiasm, but to those willing to view and treat their patients in all their relationships, interests, and idiosyncrasies, the greatest measure of success must inevitably accrue.

Photography offers almost endless charms for the open-air liver, and no longer can be characterized as a "black" or "dark" art. To those able and wishful to take up this fascinating and artistic pursuit we commend the *Photographic Monthly*,⁵ a particularly helpful and most charmingly illustrated periodical, and the *Year-Book of Photography and Amateur's Guide for 1906-1907*,⁶ an indispensable reference-book, which no photographer can afford to be without.

For tuberculous conditions involving the larynx "the silence cure" often accomplishes much, but for some chronic cases of pulmonary affections and for many predisposed to consumption a wisely-directed course of respiratory exercises and singing lessons may be of considerable service. For guidance in this matter medical practitioners would

¹ "A Handbook of the British Colonial Empire, based upon the 'Colonial Office List.'" By W. H. Mercer, C.M.G., and A. J. Harding. Pp. 202. With Map. London: Waterlow and Sons, Ltd. 1906. Price 2s. 6d. net.

² "Newest Plan and Guide of Berlin." Translated from the Thirty-second edition of "Grieben's Guide Books," vol. xxv. By Millie T. Russell. Pp. 98. With 4 Maps. London: F. Mackie and Co., 65, Long Acre. 1906. Price 1s. net.

³ "A Concise History of Europe." By Avarly H. Forbes, M.A. Pp. 203. London: Ralph, Holland and Co. 1906. Price 2s. net.

⁴ "The Climber's Note-Book." London: T. Fisher Unwin. 1906. Price 1s. net.

⁵ *The Photographic Monthly*. Edited by H. Snowden Ward and Catherine Weed Ward. London: Dawbarn and Ward, Ltd., 6, Farringdon Avenue, E.C. Price 3d. monthly.

⁶ *The Year-Book of Photography and Amateur's Guide for 1906-1907*. Edited by F. J. Mortimer, F.R.P.S. London: *The Photographic News Office*, 9, Cecil Court, Charing Cross Road, E.C. Price 1s. paper, 1s. 6d. cloth.

do well to consult Madam Carolo's recently-issued manual,¹ written in conjunction with Dr. Patrick Daniel. It is not only a highly suggestive scientific work on the mechanism and management of the voice, but is an artistically presented literary effort of exceptional merit, and deserves thoughtful study.

MOTORING AS A THERAPEUTIC AGENT.

Motoring has rapidly gained distinction as a sport, and finds many enthusiasts who practise it as a health-preserving pastime. For country hospitals and sanatoria a reliable motor affords the most convenient form of locomotion for staff and patients. It is only recently that anything like a serious test of motoring as a therapeutic agent for tuberculous cases has been attempted. The results so far seem to indicate that under carefully selected conditions motoring may be a very useful means of securing "open-air" treatment for suitable cases. Medical men and others desirous of obtaining a simple, concise, and reliable guide to motor-cars, their construction and use, would do well to consult Mr. Douglas Leechman's well-illustrated and lucid little handbook.²

As a motorist's "Who's Who" and illustrated directory of the world's automobile doings the work of Messrs. Noel B. and Edward Kenely is quite an encyclopædia.³

WORKS OF REFERENCE.

Professor Clifford Allbutt⁴ is evidently determined that his masterly "System of Medicine," the first volume of which appeared in 1896, shall maintain its pre-eminent position as a truly representative and up-to-date British work. The first volume of the new series, constituting the second edition, contains much of interest to the student of tuberculosis. Dr. John Tatham affords the latest statistical information; Sir Hermann Weber and Dr. Michael G. Foster discuss the climatic and sanatorium treatment of consumption; Dr. Francis H. Williams contributes a particularly valuable and well-illustrated description of the application of X rays in the diagnosis of pulmonary tuberculosis; and throughout the book there are many references throwing much new light on the problem. This new volume should be in the possession of every practitioner of medicine desiring to keep abreast of the times.

We have received the first two volumes of a new encyclopædia and dictionary of medicine and surgery⁵ which, under the able editor-

¹ "The Common-sense of Voice Development." By Irene San Carolo and Patrick Daniel, D.P.H., L.R.C.P., M.R.C.S. Pp. 196, with six Plates. London: Baillière, Tindall and Cox. 1906. Price 5s. net.

² "The Autocar Handbook: A Guide to the Motor Car." By Douglas Leechman. Pp. 219. London: Iliffe and Sons, Ltd. 1906. Price 1s. 6d. net.

³ "The Motoring Annual and Motorist's Year-Book" (illustrated) for 1906. Second edition. Pp. 508. Edited by Noel B. Kenely and Edward Kenely. London: *Motoring Illustrated*, 11, Arundel Street, Strand, W.C. 1906.

⁴ "A System of Medicine." By Many Writers. Edited by Thomas Clifford Allbutt, M.A., M.D., LL.D., D.Sc., F.R.C.P., F.R.S., F.L.S., F.S.A., Regius Professor of Physic in the University of Cambridge; and Humphry Davy Rolleston, M.A., M.D., F.R.C.P. Vol. i. Pp. 1209. London: Macmillan and Co., Ltd. 1905. Price 25s. net.

⁵ "Green's Encyclopædia and Dictionary of Medicine and Surgery." Vol. I.: Aachen to Brain. Pp. 538. Vol. II.: Bread to Ear. Pp. 528. Edinburgh and London: William Green and Sons. 1906.

ship of Dr. J. W. Ballantyne, promises to be a valuable addition to the already large number of reference works dealing with the healing art. The work is in a measure a partial repetition and an extension of the "Encyclopædia Medica," published by the same firm between 1899 and 1904. It contains both elaborate articles and paragraphs of a distinctly dictionary character. This encyclopædia-dictionary should prove of much service to the busy practitioner. The editor well knows the needs of the busy practitioner, and has done his best to meet them. Vol. II. contains excellent sections on affections of the bronchi, clinical investigation of the chest, climate, diet, disinfection, and other subjects of particular interest to the student of pulmonary tuberculosis.

Among up-to-date reference works of the greatest value to the therapist, E. Merck's Annual Reports¹ occupy a foremost place. In the latest issue there are valuable notes on a large number of new drugs used in cases of tuberculosis.

BOOKS FOR THE SICK CHILD.²

In the management of tuberculous and other sick children, picture-books provide a never-failing source of delight.

Messrs. Dean and Co. have introduced a series of coloured, indestructible, toy rag-books. The colours cannot be sucked off, and the books can be washed in boiling water or soaked in disinfectants. They are, in short, just the very thing long wanted for hospital and sanatorium use. The same firm have also prepared a most fascinating collection of rag knockabout toys. These delights ought to be known by all parents, and should be brought home to every child. We cannot too highly commend this really artistic and hygienic invention.

For children of all ages Messrs. Alfred Cooke, Ltd.,³ supply a variety of beautifully illustrated books, in all of which artist, and writer, and printer, and publisher have enthusiastically combined to give of their best for the fascination of the little folk. These works only need to be known to be prized in every home and hospital.

The "Told to the Children" Series, edited by Louey Chisholm, and The "Children's Heroes" Series, edited by John Lang, include a number of delightful volumes,⁴ with peculiarly attractive coloured illustrations and simple but graceful text, which parents and nurses as well as little folk will greatly prize.

The "Pig Book"⁵ deserves to be known in sanatoria (for has not one placed the indiscriminating overfeeder on its armorial bearings?), and will prove a source of much amusement to children of all ages.

BOOKS AND BOOK CLUBS.

The medical and nursing staff of our hospitals and sanatoria, and, indeed, medical practitioners and nurses generally, find book-buying a

¹ "Report on the Advancements of Pharmaceutical Chemistry and Therapeutics." Vol. xix. 1905. Darmstadt, May, 1906. London: 16, Jewry Street, E.C.

² Messrs. Dean and Co., Ltd., 14, Paternoster Row, London, E.C.

³ Published by Messrs. Alfred Cooke, Ltd. London: Birkbeck Bank Chambers, Holborn.

⁴ Published by T. C. and E. C. Jack, Henrietta Street, London, W. Price 1s. and 1s. 6d. each.

⁵ "The Pig Book." Published by Dean and Son, Ltd., 160A, Fleet Street, London, E.C. Price 2s. to 10s. 6d.

luxury to be restricted often to undesirably narrow limits. For such a good lending library is an absolute necessity. Lewis's Medical and Scientific Library¹ has long enjoyed an almost unique reputation, and recent improvements in regard to terms of subscription and means of distribution should greatly add to its popularity and usefulness.

Boots's Book-lovers' Library² offers one of the simplest and most economical means of procuring the best books, not only in London, but in the chief towns of the country. The system only needs to be known to be approved. We commend it to the notice of our readers.

Lovers of art will do well to procure a copy of the new and beautifully illustrated list of reproductions of famous works of art issued by the autotype company.³ These permanent photographic reproductions are admirably suited for hygienic and artistic homes.

Every hospital and sanatorium should now possess a well-equipped library, capable of catering for the diversified tastes of all classes of patients, and, thanks to the enterprise of modern publishers, excellently printed, inexpensive, and therefore easily replaced, editions of all the more important classical works are now available. Special mention should be made to the Everyman's Library,⁴ which brings the best within the reach of the poorest book-loving patient.

Newnes's Thin Paper Classics⁵ also provide an admirable series of pocket volumes for the invalid, printed in large, clear type, on thin but opaque paper.

"Benson's Facts for Advertisers"⁶ is a remarkable collection of data bearing on press-work and advertising, which every journalist and advertiser will find indispensable.

The Journal of the Outdoor Life,⁷ the official organ of the American National Association for the Study and Prevention of Tuberculosis, claims that its aim is "to be helpful to persons seeking health by an outdoor life, and particularly to disseminate reliable information looking to the prevention and cure of tuberculosis." It is an attractive publication, illustrated, well printed, informing, and amusing, appealing to the scientific physician as well as the health-seeking layman, and deserves to be well known on both sides of the herring-pond.

¹ See "Catalogue of Lewis's Medical and Scientific Library, including a Classified Index of Subjects, with the Names of those Authors who have treated upon them"; and "Second Supplement, 1902-1905, with Quarterly List of New Books and New Editions," forming an invaluable series for reference.

² See "A Catalogue of Modern Literature." Pp. 841. London: 29, Farringdon Road, 1905. Price 1s. 6d. Contains a selection of well-known works circulated by the Book-lovers' Library.

³ "An Illustrated Catalogue of Fine Art Reproductions." Revised Edition. Pp. 116. With 30 Plates. London: The Autotype Company, 74, New Oxford Street, W.C. 1906. Price 1s.

⁴ A complete list of the volumes (1s. net, cloth) already issued in the Everyman's Library may be obtained on application to the publishers, J. M. Dent and Co., Bedford Street, London, W.C.

⁵ Published by George Newnes, Ltd., Southampton Street, Strand, London, W.C., at 3s. and 3s. 6d. each.

⁶ Compiled and published by S. H. Benson, Ltd., 1, Tudor Street, London, E.C. Pp. 410. With Maps. 1906-1907. Price 5s. net.

⁷ Published monthly at Adirondack Cottage Sanatorium, Trudeau P.O., Saranac Lake, N.Y. Price \$1 a year.

*The Architectural Review*¹ in its issue for June, 1906, gave an authoritative description of the King Edward VII. Sanatorium, written by its architect, Mr. N. Percy Adams, and accompanied by plans and a series of admirable illustrations.

Science Progress,² a new quarterly issued under the editorship of Dr. N. H. Alcock and Mr. W. G. Freeman, promises to meet the requirements of those scientific students who aim at maintaining a comprehensive view, and, while seeking diligently to know everything of something, would still learn something of everything in the realm of scientific research. Among the numerous and valuable contributions to the last number, special mention may be made of Dr. A. C. Inman's "Science in Medicine," which deals with recent advances in the treatment of disease following on the discovery of opsonins.

The Johns Hopkins Hospital Bulletin for October, 1906, contains an interesting critical review of "Tuberculosis Work in Europe," by Dr. Joseph Walsh.

Among the all sorts and conditions of diaries provided for 1907 we have received several which are likely to meet the requirements of our readers.

Collins' "Handy Diary"³ is of convenient size ($4\frac{3}{4}$ in. by $3\frac{1}{8}$ in.), with thin but good paper, a page to each day, affording generous allowance of space.

De La Rue's series of dainty diaries⁴ well maintain their high reputation for delicate and artistic form combined with compactness and convenience. The "Portable" Diaries, printed in colours and enclosed in silk and leather covers, make ideal pocket remembrancers. The "Tablet" Calendars are admirably adapted for the home, the consulting-room, and the hospital.

¹ Published at the office of *The Architectural Review*, London: Great New Street, E.C. Price 1s. net.

² *Science Progress in the Twentieth Century*. A Quarterly Journal of Scientific Thought. London: John Murray. Price 5s. net.

³ Published by William Collins, Sons and Co., Ltd., 144, Cathedral Street Glasgow. Price 1s. to 3s. A similar "pocket" form is issued at from 6d. to 3s.

⁴ Published by Thomas De La Rue and Co., Ltd., Bunhill Row, London.

PREPARATIONS AND APPLIANCES.

REQUISITES FOR THE SANATORIUM AND THE HYGIENIC HOME.

THOSE responsible for the up-keep of establishments devoted to open-air treatment know well that, beneficial as free exposure to fresh air is to patients, it is sadly detrimental to the structure and much of the equipment of a sanatorium. Constant attention and prompt action is needed if the wise step in time is to be taken.

HALL'S WASHABLE DISTEMPER¹ is a sanitary water-paint which gives results artistically pleasing and hygienically sound. It possesses marked disinfectant properties and is non-poisonous. It fills cracks and holes, and prevents the accumulation of dust in all recesses. It can be thoroughly washed, is very durable, and is not expensive, and can be supplied of various suitable colours. This excellent preparation can be readily applied to walls and ceilings, woodwork and stone, and even to brick walls, and should be extensively used in sanatoria and all institutions and houses used by consumptive cases.

RONUK SANITARY POLISH² has a reputation which is practically world-wide. For the polishing of wooden flooring of hospitals and sanatoria we know of no better preparation. By its application dust-collecting cracks and pores are filled up, a hard, durable surface is formed, and a bright appearance and agreeable fresh odour is given to the rooms and wards. After considerable experience of this polish we have no hesitation in declaring it a necessity alike for the hygienic dwelling and the well-conducted institution.

Much wisely directed industry and ingenuity is now being devoted to the preparation of hygienic appliances for the home as well as for the hospital. THE CLARKSTAND,³ which we have had opportunities of testing, is a very simple but most effective folding cloak and umbrella stand, strong in construction, pleasing in design, thoroughly efficient in action. It can be placed anywhere, easily removed, and when closed can be stowed into a small space. It is peculiarly suited for use in the open, at garden-parties, on the playing-field, for tent life, and in sanatoria and country homes, as well as for private dwellings. It only needs to be known to be extensively used.

Everyone responsible for the conduct of a sanatorium or similar institution must have felt the want of a simple and effective means of rapidly multiplying copies of writings, plans, diagrams, and the like. This need is admirably met in ZUCCATO'S PATENT TRYPOGRAPH.⁴ It is a

¹ Manufactured by Messrs. Sissons Brothers and Co., Ltd., Hull.

² Prepared by "Ronuk," Ltd., Portslade, near Brighton. London depot: 86, York Road, Lambeth, S.E.

³ The Garden-party Stand, price 15s. 6d. (the Clarkstand Patent, No. 13,727), is made by The Clarkstand Co., 24, Silver Street, Wellingborough, Northants.

⁴ The Trypograph Duplicator is supplied by W. B. Perry, 15, Charterhouse Street, Holborn Viaduct, London, E.C., from 25s. upwards, according to size and quality.

stencil copying apparatus, easy to work and comparatively inexpensive. Any number of copies can be rapidly produced in black or coloured inks direct from the original writing or drawing. We have used it ourselves with much comfort and advantage, and have no hesitation in strongly recommending it.

HYGIENIC SMOKING.

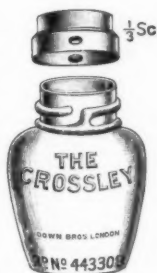
For many consumptives smoking is undesirable; but for not a few inveterates to be deprived of tobacco is to suffer indescribable distress. "The weed" may be robbed of much of its deleterious qualities by being used only in a suitable hygienic pipe. THE SLO-COM PIPE¹ is constructed to arrest dust and juices in a filtering and absorbing fabric placed in the stem. It certainly removes some of the irritants, and does not seriously impair the delights of the habit. In using this and all other pipes consumptive smokers must conform strictly to hygienic requirements.

THE COLLECTION AND DISPOSAL OF TUBERCULOUS SPUTUM.

The first essential in the control of tuberculosis is to secure the collection and destruction of all tuberculous discharges. Whatever views may be held as to the degree of infectivity of the sputum of consumptives, with our present knowledge a neglect to provide for the collection and adequate disposal of the expectoration of consumptives must be counted as little less than criminal. The difficulties which have to be surmounted are many and formidable. The ideal flask has still to be discovered. That devised by Dr. Dettweiler, of Falkenstein, in the Taunus, is the most generally used, and is usually considered the best. Excellent flasks of this pattern, fitted with nickelled spring lids and screw caps, are supplied by Messrs. Maw and Sons,² and these we have used with much satisfaction.

Dr. Lloyd Smith, medical director of the Crossley Sanatorium, has devised a flask the chief features of which are indicated in the accompanying figure.³ We have found them of service for cases where the amount of expectoration is not considerable. They have the great advantage of being reasonable in price.

A very similar form of flask, of stout glass, with nickel cap fitted inside with a thin rubber disc, and graduated in $\frac{1}{2}$ ounces up to 4 fluid ounces, is made by Messrs. Beatson and Co., of Rotherham. This firm also supply the cheapest and simplest form of efficient pocket vessel for the collection of sputum which we have had an opportunity of testing. It consists of a flask-shaped bottle of dark blue glass,



¹ Manufactured by the Slo-com Pipe Co., 1 and 2, Chiswell Street, London, E.C., at prices from 1s. 6d. to 3s. 6d.

² Messrs. S. Maw, Son and Sons, 7-12, Aldersgate Street, London, E.C., supply flasks of the Dettweiler pattern in several forms, and both in glass and aluminium, at special rates to sanatoria and hospitals.

³ The "Crossley" flask may be obtained at 9s. per dozen from Down Bros., Ltd., 21, St. Thomas's Street, Borough, London, S.E.

having a wide mouth fitted with a solid, non-absorbent rubber composition plug.¹ We have used these flasks extensively. For work among the poor they are excellent. Public health authorities and others interested in the stamping out of tuberculosis would do well to arrange for their distribution among the necessitous poor visiting our public hospitals or medically attended in their own homes.

We have been furnished with specimens of the "Lister Pocket Sputum Cup" and the "Red Cross Sputum Cup," which we understand have found favour in America. They consist of stout paper with absorbent and antiseptic lining, and are to be burnt after using.²

An attractive form of sputum mug, fitted with cover and made of aluminium, has been submitted to us.³ We believe it to be devised by Dr. M. S. Patterson, of the Frimley Sanatorium. It is, however, somewhat expensive, and, of course, will not stand alkalies, both serious drawbacks.

Even with an efficient sputum flask patients cannot be expected to dispense entirely with a pocket-handkerchief. Butter-muslin offers, perhaps, the most convenient material for such a purpose, and after use for a day or less can be burnt. Paper handkerchiefs are cheaper, but not so pleasant to use. So-called PAPERKCHIEFS⁴ resemble Japanese paper and are soft yet strong, have considerable absorbent power, and can be easily burnt. Suitable holders are also provided.

Dr. D. Lloyd Smith, the Medical Director of the Crossley Sanatorium, the country branch at Delamere of the Manchester Hospital for Consumption and Diseases of the Throat and Chest, has with artistic adaptability and scientifically directed inventiveness designed a series of coloured linen washable bags, in which patients may safely carry sputum flasks, pocket-handkerchiefs, and other necessities.

Dr. Harold Downes, of the Bellefield Sanatorium, Lanark, N.B., has sent us a simple lining for the pockets of consumptives. It is cheap, and can be readily sterilized by boiling. These or similar pocket linings are certainly very necessary for phthisical patients, and desirable for all who would follow the hygienic life.

We hold very strongly that every consumptive, whose expectoration contains tubercle bacilli should shave; this, unfortunately, is often neglected, and, strange to say, is not generally insisted on or even encouraged in many British sanatoria.

ANTISEPTICS, DISINFECTANTS, AND DEODORANTS.

In maintaining conditions desirable for healthy life and necessary for the hygienic management of disease, agents belonging to the above groups are practically essential under modern methods of so-called civilization. The preparations clamouring for notice are simply legion. Reference can only now be made to some few which we have found of service in sanatorium and private practice.

¹ This flask may be obtained from Messrs. Beatson and Co., Rotherham, at 5s. per dozen, or 57s. per gross.

² These sputum receptacles are made by Johnson and Johnson, New Brunswick, N.Y., U.S.A., and can be obtained from their English agents, John Timpson and Co., Ltd., 104, Golden Lane, London, E.C.

³ The makers are Messrs. Frederick Braby and Co., Ltd., 352-364, Euston Road, London, N.W.

⁴ Supplied by the "Papkerchief" Syndicate, 34, Fenchurch Street, London, E.C.

"KRYSYL" is a coal-tar derivative resembling carbolic acid in its action. It is non-caustic, and on mixing with water forms a milky, opalescent fluid. It has the advantage of being inexpensive, and is well suited to the requirements of hospitals and sanatoria.

"PINESYL"¹ is a non-poisonous disinfectant, forming with water a milky, opalescent solution, and affording a very agreeable pine-like odour. We have found it very useful for sputum flasks.

Formaldehyde has rapidly won its way into the front rank of germicides. This agent has been made use of in "LISTER'S FUMIGATOR,"² which simply consists of a candle of solidified formaldehyde enclosed in a fireproof container. After testing this convenient form of disinfectant we are of opinion that it will be of distinct service in the cleansing of tuberculous rooms.

CLINICAL INSTRUMENTS.

Auscultation, since the days of Lænnec, has afforded the most helpful method of examining chest cases. Stethoscopes of every conceivable form have been introduced, but, generally speaking, the simplest in construction are the most reliable in actual practice.

The single-tube stethoscope with bell-shaped earpiece, constructed after the design of Dr. Graham Steell, is the acme of simplicity, and the most effective auscultating instrument with which we are acquainted.³

The binaural stethoscope presents many advantages, and for private work and examination of child patients is practically essential. The STETHONOSCOPE⁴ is constructed upon the same principle as the microphone, and certainly renders certain cardiac murmurs and pulmonary râles more audible. After fully testing the instrument, we are of opinion that it will prove of considerable service in general practice, and, perhaps, particularly in out-patient and dispensary work.

Thermometry is of the greatest value as affording one of the most reliable guides to the management of tuberculous cases. Whether taken orally, which in public institutions is usually desirable, or *per rectum*, a thoroughly reliable thermometer is essential. Among the many excellent instruments now available, THE REPELLO⁵ deserves mention as a rapid and reliable thermometer which, by an ingenious construction, can be reset without shaking.

Messrs. Allen and Hanbury⁶ supply reliable thermometers at very cheap rates to public institutions, and arrange for them to be numbered and marked with the name of any hospital or sanatorium.

¹ Both these preparations are made by Baiss Brothers and Stevenson, Ltd., Jewry Street, London, E.C.

² "Lister's Fumigators" are prepared by Messrs. Johnson and Johnson, New Brunswick, N.Y., U.S.A., and can be supplied by their English agents, John Timpson and Co., Ltd., 104, Golden Lane, London, E.C.

³ These are made of rosewood in different sizes by Messrs. Wood and Son, Surgical Instrument Makers, Manchester.

⁴ The stethoscope is made by Messrs. S. Maw, Son and Sons, 7-12, Aldersgate Street, London, E.C.

⁵ The Repello is manufactured by G. H. Zeal, 82, Turnmill Street, London, E.C.

⁶ Particulars and prices can be obtained from Messrs. Allen and Hanbury, Wigmore Street, Cavendish Square, London, W.

HYGIENIC CLOTHING FOR THE TUBERCULOUS.

In the maintenance of the hygienic life and the rational conduct of open-air methods and sanatorium treatment too little attention is often given to the important matter of clothing. While insisting on the importance of fresh air, abundant feeding, and strict medical supervision, it is well that the most important matter of hygienic dress for both staff and patients should not be overlooked.

As far as possible all apparel likely in any way to be contaminated by tuberculous discharges should be of washable material, or such as can be periodically disinfected. Messrs. E. and R. Garrould¹ have submitted to us samples of their white washing drill jackets, which in length, form, and general characters are admirably suited to the requirements of the medical staff of all sanatoria and hospitals for consumptives. The same firm provides a cheap white duck or dungaree washable suit, which should be of much service for certain classes of patients, particularly during the hot months of summer.

AERTEX CELLULAR CLOTHING,² as we can testify from personal experience, is particularly comfortable and hygienic. For the consumptive and those predisposed to tuberculous disease it offers many advantages. The meshes of the garments containing non-conducting air, renders them warm in winter and cool in summer. Free evaporation is allowed and no irritation is produced. The fabrics, whether of cotton or other material, owe their special characteristics to the method of weaving employed. The clothing is light, durable, easily washed, and does not readily shrink. Medical practitioners would do well to make themselves acquainted with the many advantages of this excellent form of cellular clothing.

We have recently had an opportunity of testing the "AUSTRAL-LAMA"³ woollen underwear, which may be obtained in all forms and sizes. The yarn from which the garments are made is the resultant of the judicious blending of the finest Australian fleece with that from the Indian Cashmere sheep or goat. The goods are light and soft, affording the maximum of warmth with the minimum of weight, are non-irritating to the skin, and if washed properly do not shrink. In short, they form an almost ideal clothing for the healthy, and afford a most desirable protection for the delicate and tuberculous.

The "TWO STEEPLES"⁴ underwear, supplied in various forms at prices to suit all pockets, is admirably suited for tuberculous patients undergoing the open-air cure. We have personally tested these goods, and can thoroughly recommend them.

The SCRIVENER CUFF PROTECTOR⁵ is an ingenious contrivance for saving the linen shirt cuff from collecting dust and dirt, and should be acceptable to many a busy medical practitioner.

¹ Messrs. E. and R. Garrould, 150 to 160, Edgware Road, Marble Arch, London, W.

² Aertex is manufactured by the Cellular Clothing Co., Ltd., 72 and 73, Fore Street, London, E.C.

³ See "The Book of Scotch-made Underwear," issued by Messrs Greensmith, Downes and Son, 143, George Street, Edinburgh.

⁴ Full particulars concerning the "Two Steeples" clothing can be obtained from 1, Fell Street, London, E.C.

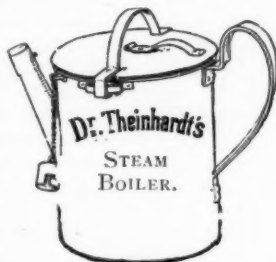
⁵ Supplied by Messrs. Vanheems and Wheeler, 47, Berners Street, Oxford Street, London, W.

DIETETIC PREPARATIONS AND FOOD PRODUCTS.

In the modern treatment of tuberculosis diet occupies a foremost place. Although unphysiological hyper-alimentation has in great measure been discarded, a successful combat with consumption requires unremitting attention to the selection, preparation, and wise supply of suitable nutrients. Tuberculosis is essentially a problem in nutrition. In addition to the generally approved natural foods, provided in rich abundance by both the animal and vegetable kingdoms, it is often helpful to employ some of the almost numberless special dietetic preparations which now flood the market and perplex the practitioner.

SANATOGEN¹ is a valuable dietetic adjunct, as we have proved in a number of instances. Even when patients are living under the most perfect hygienic conditions of sanatorium life it is not unusual for them to reach a point far short of full recovery, when appetite fails, weight ceases to advance, and general progress appears to be arrested. For these "stationary" cases we have found Sanatogen of distinct benefit. It is composed of 95 per cent. of pure casein and 5 per cent. of glycerophosphate of sodium. It is a wholesome, harmless, readily assimilated preparation of marked nutritive value, and experimental research seems to indicate that the phosphorus contained in the sodium glycerophosphate of casein is almost entirely taken up into the system. It is certainly a preparation which deserves trial in all tuberculous cases, and particularly children.

For the preparation of certain forms of infants' and invalids' food DR. THEINHARDT'S STEAM BOILER² is of considerable service. It is of strong construction, simple to manipulate, and thoroughly efficient. Its chief features are indicated in the accompanying figure. The following are the "authorized" directions for the preparation of Dr. Theinhardt's food by means of the steam boiler: "The quantity of food suitable to the age of the child is carefully mixed with the corresponding quantity of hot water in the steam boiler, and, the spout having been closed with the indiarubber stopper and metal cover, it is allowed to boil for two or three minutes, stirring carefully the while. The necessary milk is then added, and the whole boiled until it bubbles well up. The vessel is now closed with the lid, and the sheet of asbestos placed underneath to avoid burning. As soon as the boiling-point is attained, as shown by the contents rising to the air-hole, the vessel must be drawn away from the open fire and allowed to simmer for two or three minutes on the hob, or, if cooking on a gas-stove, the flame should be turned down as low as possible. The steam boiler, still closed, is then placed on one



¹ Supplied by the Sanatogen Company, 83, Upper Thames Street, London, E.C.

² The steam boiler (price 12s.) may be obtained from Dr. Theinhardt's Food Company, Ltd., at the London depot, C. Hohmann, 6, Catherine Court, Seething Lane, E.C.

side for three or four minutes, in order to allow the steam to escape, and the contents are then shaken, the spout opened, and the food poured at once into clean bottles, previously warmed. These are then corked and kept in a cool place until required."

Callard and Bowser's BUTTER-SCOTCH¹ has justly won a world-wide reputation as a wholesome and palatable sweetmeat. It, however, deserves to rank as a nutrient of high value, composed as it is of pure butter and good sugar. It might well be extensively used in sanatoria where carbohydrates and hydrocarbons are essential for effective dietetic treatment. We believe this preparation would be of much benefit to many tuberculous children. It is also a very efficient demulcent, and will be found to be useful in allaying many forms of troublesome cough.

Pascall's GOLDEN MALTEX² is another attractive confection of considerable dietetic value. It consists of butter, sugar, and a reliable extract of malt, and forms a delicious compound, much beloved by children of all ages. A preparation like this might well be popular in sanatoria. As a soothing agent in irritable pharyngeal conditions, it is to be thoroughly recommended.

THERAPEUTIC PREPARATIONS.

Of recent years the so-called hygienic management of tuberculosis has monopolized attention, and scant attention has been devoted to the action of drugs on predisposed and affected tissues. Recent pathological researches tend to show that after all the nature of the tuberculously inclined soil is probably of more importance than the virulence of the tuberculous seed. Work on opsonins and observations on serum-therapy, together with a number of recent important pharmacological researches, all go to indicate the necessity for directing greater attention to a more systematic and scientific employment of therapeutic measures. In the past drugs have been employed in an empirical and haphazard fashion; but with more reliable methods of testing the reaction of living tissues to restorative influences which are now becoming available, it may be hoped that keener interest will be taken in the employment of medicaments in the management of tuberculosis.

"PYRILIN," or Mist. Phospho-pyridin Co.,³ is said to be prepared from the products of the destructive distillation of bones. It has been used with benefit in phthisis and other pulmonary affections, reducing temperature, decreasing night-sweats, and allaying irritable cough.

Counter-irritants and antiphlogistic preparations, whatever may be the precise nature of their pharmacological action, undoubtedly occupy a useful place in assuaging the manifold aches and pains, whether muscular or pleuritic, which are such common and troublesome features in many cases of pulmonary tuberculosis. THERMOGENE⁴ is a medi-

¹ Manufactured by Callard and Bowser, Duke's Road, Euston Road, London, W.C.

² Prepared by James Pascall, Ltd., 100 and 101, Blackfriars Road, London, S.E.

³ Pyrilin is prepared by Messrs. Lorimer and Co., Ltd., Britannia Row, Islington, London, N.

⁴ Manufactured by the Thermogene Company, Hayward's Heath, Sussex, and supplied at special rates to hospitals and sanatoria.

cated absorbent wadding specially prepared according to Vandenbroeck's process, and owing, if we mistake not, much of its useful properties to the presence of a preparation of capsicum. We have employed this application in a number of cases of chest pain with considerable advantage.

ANTIPHLOGISTINE¹ is another preparation which is often of service in pleuritic cases. It is said to be composed of glycerin, boric and salicylic acids, ferrous carbonate, peppermint, gaultheria, eucalyptus, and iodine, combined with an earthy basis.

ORAL SEPSIS AND TUBERCULOSIS.

Pyorrhœa alveolaris, or Rigg's disease, as it is often termed, is of very common occurrence in consumptives. Mr. Lawson Dodd has recently drawn attention to the importance of this condition and other dental deficiencies in the management of tuberculous patients.²

It is becoming clear that a certain proportion of the so-called "dyspepsia of the phthisical" is really dependent upon the swallowing of purulent material arising from oral sepsis. It is therefore incumbent on all responsible in any way for the hygienic management of consumptives to pay heed to the toilet of the mouth.

Among the numerous antiseptic preparations now available for the mouth and naso-pharyngeal cavities, we consider FORMOLYPTOL³ one of the best. It is non-toxic and non-irritant, of agreeable odour and pleasant taste, possesses considerable germicidal power, and can be effectively employed in practically any form of local application. It consists of formaldehyde and aceto-boro-glyceride in combination with certain antiseptics.

FORMAMINT⁴ in the form of tablets we have found of considerable service as an excellent substitute for mouth washes and gargles. They are said to be composed of a chemical combination of formic aldehyde with lactose. By the action of the saliva the former is liberated, and acts as a very efficient means of cleansing the mouth.

"PHILLIPS' MILK OF MAGNESIA"⁵ is also a most useful preparation in the treatment of oral sepsis. It is a hydrated oxide of magnesium (MgH_2O_2), containing no carbonic acid, and each ounce represents 24 grammes of magnesium hydrate. It forms a pleasant and effective mouth wash, and is a valuable antacid in various forms of gastrointestinal derangement.

¹ Antiphlogistine is supplied by the Denver Chemical Manufacturing Company, 110, Cheapside, London, E.C.

² "The Relation of Dental Conditions to Pulmonary Tuberculosis," Transactions of the Odontological Society of Great Britain, vol. xxxviii., No. 8, 1906.

³ Formolyptol is supplied by Andrus and Andrus, 46, Holborn Viaduct, London, E.C.

⁴ Formamint tablets are supplied by A. Wulff and Co., 83, Upper Thames Street, London, E.C.

⁵ "Phillips' Milk of Magnesia" is prepared by the Charles N. Phillips' Chemical Company of London and New York. London Office: 14, Henrietta Street, Covent Garden, W.C.

INHALERS, NEBULIZERS, SPRAYS, AND VAPORIZERS.

In the treatment of affections of the respiratory passages much ingenuity has been displayed in the invention of all sorts and shapes of appliances whereby medicaments might be brought into contact in a suitable form with the morbid structures.

For bronchiectatic cases and certain other affections of the respiratory organs, WRIGHT'S COAL-TAR INHALER AND VAPORIZER¹ offers a simple and convenient means of employing medicated vapour. Not only can the special coal-tar vaporizing liquid be used, but also pine preparations and other sedative and antiseptic agents.

The "GLASEPTIC NEBULIZER,"² except for its rubber bellows, has the great advantage of being entirely constructed of glass, and can be effectively employed with solutions of almost any density and greatly varying viscosity. It is admirably suited for the application of medicaments to the mucous membrane of the nasal, pharyngeal, and respiratory passages. We consider it one of the simplest and best of those we have had the opportunity of testing.

The well-known disinfectant CYLLIN³ can now be employed as an inhalant in a special form of inhalator. We have used it in many cases of pulmonary tuberculosis with marked benefit. In certain cases with laryngeal and bronchial involvement it lessens cough and diminishes the amount of secretion.

AMUSEMENTS FOR TUBERCULOUS PATIENTS.

An attempt has been made to show that consumptives have certain more or less well-defined psychological characteristics. Be this as it may, it is generally admitted that suitable amusements and reasonable forms of work must be found for tuberculous patients, whether treated in their own homes or in sanatoria, if intellectual deterioration and moral decadence is to be prevented. In too many cases bodily healing is now secured only with the loss of that which makes life most worth the saving.

PLASTICINE,⁴ introduced by Mr. William Harbutt, offers a hygienic, artistic, and delightful form of instructive amusement suited to patients of almost every age and position. It is a modelling material, cleanly, non-poisonous, possessing antiseptic properties, always plastic and ready for use. It is supplied in different colours, and may be obtained in boxes arranged to meet the requirements of children, art students, and others. Plasticine is an excellent medium for all kinds of modelling, and deserves to be known by all scientific workers.

¹ Supplied by Messrs. Wright, Layman and Umney, Ltd., 48, Southwark Street, London, S.E. Price, complete, 3s. 6d.

² Manufactured by Parke, Davis and Co., 111, Queen Victoria Street, London, E.C.

³ Cyllin is supplied by Jeyes' Sanitary Compounds Company, Ltd., 64, Cannon Street, London, E.C.

⁴ All particulars may be obtained from William Harbutt, A.R.C.A., Plasticine Works, Bathampton, near Bath.

FOUNTAIN PENS.

To officers and patients in sanatoria, and all those following the principles and practice of the open-air life, a reliable fountain pen is almost a necessity. Among the rapidly multiplying varieties "THE WATERMAN"¹ occupies a foremost place. Its chief feature is an excellent vulcanite spoon-feeder, which ensures a steady flow of ink to the nib and prevents all dangers of blotting. The pen holds a large quantity of ink, and can be thoroughly relied upon as a first-class instrument for the scrivener.

"THE POST"² is of quite exceptional construction, being supplied with an arrangement for self-filling, thus obviating many of the difficulties and inconveniences incidental to replenishing. It is of excellent construction, easily manipulated, readily cleaned, and makes penmanship a pleasure.

"THE RITA"³ is constructed after the best type of the more expensive forms of fountain pen, but is issued at a much lower price, and appears to be thoroughly reliable, efficient, and convenient, and its exceptionally low price brings it within the reach of all.

"THE RED DWARF"⁴ is a diminutive form of stylograph, compact in form, convenient in size, and admirably meeting the need of those requiring a small and inexpensive pen of the stylo type.

We have carefully tested each of these varieties, and can thoroughly recommend them.

¹ "The Waterman Ideal Fountain Pen." Price 17s. 6d. L. and C. Hardtmuth, Koh-i-noor House, 112, Golden Lane, London, E.C.

² "The Post Fountain Pen." Prices 8s. 6d. to 21s. Conway Stewart and Co., 34, Paternoster Row, London, E.C.

³ "The Rita Fountain Pen." Price 3s. 6d. E. J. Reid and Co., Dunedin House, Basinghall Avenue, London.

⁴ "The Red Dwarf Stylograph." Price 3s. 9d. J. Kearney and Co., 47, Dale Street, Liverpool.

NOTES AND NOTICES.

A NATIONAL SANATORIUM FOR CONSUMPTIVE CHILDREN.

It is remarkable that among the numerous sanatoria established throughout the country during the last few years the claims of the children have been almost entirely overlooked. This, we are glad to note, is to be rectified speedily by at least one of our great institutions devoted to the care of the nation's children. Those responsible for the Children's Home and Orphanage (Bonner Road, N.E.), acting on the advice of their experienced principal, the Rev. Arthur E. Gregory, D.D., who has been in consultation with well-known medical experts, are about to establish a country sanatorium on the best modern lines, within easy reach of London, for their consumptive little ones and those afflicted with various forms of tuberculosis, or in what may be considered a pretuberculous stage. Among upwards of 1,700 children now in residence in the different centres, there are over 200 urgently needing sanatorium treatment. Of 3,978 children received, 94 had lost both parents and 653 one parent from consumption—747 of tuberculous inheritance. During the last twenty years nearly 70 children have died of consumption, and large numbers have broken down with the disease after leaving the home and starting work. These numbers are sufficient evidence that, for the sake of each and all, a well-equipped sanatorium established on the best hygienic principles is an urgent necessity. It is to be hoped that all desiring to assist in a work of such national importance will at once communicate with Dr. Gregory at the Central Offices, Bonner Road, N.E.

A SANATORIUM FOR NORTHERN INDIA.

It is proposed to establish a sanatorium for tuberculous missionary workers and native converts at the hill station of Almora, on the southern slopes of the Himalayas, under the charge of Miss Mary Pailthorpe, M.B., B.S., from whom all particulars may be received.

AN ESTABLISHMENT FOR TUBERCULOUS WORKERS.

"The National Committee for the Establishment of Sanatoria for Workers suffering from Tuberculosis," under the presidency of Princess Christian, are founding a sanatorium at Benenden in Kent, which it is hoped will become "entirely self-supporting, without endowment from local rates, voluntary contributions, or other forms of charitable subscription." Particulars may be obtained from Mr. E. Douglas White, 19, South Molton Street, Bond Street, London, W.

A SANATORIUM FOR INVERNESS-SHIRE.

"The average death-rate from tuberculosis in Inverness-shire during the past ten years has been over seventy-five per annum." It is proposed to open a sanatorium for consumptives in the country, and beginning is to be made with ten free beds. Particulars may be obtained from the Hon. Margaret Fraser, Beaufort Castle, Beaulieu, N.B.